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*Sanitary and Realistic Dublin.**

WITH the exception of a few leading thoroughfares and squares, decay and dilapidation are making marked progress, not only in the very heart of Dublin, but in once fashionable districts north and south of the Liffey, on the borders of the old municipal boundary. Trade has completely deserted many of the streets where it flourished a quarter of a century ago; wealthy merchants and prosperous traders have disappeared in scores from their old haunts, and their extensive premises have undergone strange transformations, to suit the exigencies of a smaller class of traders, who, in many instances, are engaged in a life-and-death struggle throughout the year to keep their heads above the water. The seat of the Vice-Regal Government even is getting hemmed in by decayed streets of houses which threaten at no distant date to form a complete cordon round Dublin Castle, if no industrial revival takes place in the meantime to check the downward ruin that appears to be steadily making headway. The only redeeming feature to the dismal picture is in the growth of the townships and suburbs north and south of the city,—but particularly on the south side,—to which places many hundreds of the well-to-do families, who formerly resided in private streets in the city, have removed. Many of the city traders and shopkeepers who have lost their best customers still struggle on, while many more have followed in the wake of those who patronised them, and commenced business in the fashionable suburbs. The taxation in the city is very high, and the Corporation, partly conscious at least of the tide of decay that is setting in, or has already set in, have been contemplating for some time past the obtaining of powers to absorb some of the more immediate townships in a new city boundary, and of rendering the well-to-do inhabitants of these localities amenable to city taxation. It is argued that a large number of the township residents derive their income through business and appointments in the city, and that they should be made to contribute to the cost of the administration and improvements necessary to its well-being. The spectacle of a rapidly decaying capital is anything but a cheering sight, particularly when the decay is real and manifest. Several plagues from the thirteenth to the nineteenth century made their appearance in Dublin, including the two serious cholera visitations of 1832 and 1849. We are told of one which occurred in the sixteenth century which was so severe that the majority of the inhabitants and their rulers took flight into the suburban districts, some of the people even removing to small islands in the bay. Grass, says the historian, grew in the streets of the city, they became so desolated; but we fear there is a likelihood of grass again growing in the streets of Dublin without the intervention of any epidemic, but through causes we have indicated. It is a thousand pities that a city still reflecting in the architecture and art of her old public buildings the grandeur and prosperity of a happier era, should be so stricken with the paralysis of decay. Dublin, unlike what she was of old, has now little trade, her greatest industries being the manufacture of whisky and porter, and unfortunately her own sons are among the greatest consumers.

In some former notes we alluded to the wretched condition of the tenement houses of Dublin, and to the need of a class of dwellings suited to the wants of the very poor, comprising a large and very miscellaneous class of workers of both sexes, many of whom eke out life by uncertain employment. It is but justice to the Superintendent Medical and Executive Officer of Health, who is also City Analyist, to say that he has more than once urged upon the Corporation the necessity of providing dwellings for the poorer classes, mainly because the Public Health Committee, by its action, led to the clearing of many hundreds of houses within the last few years which had been totally unfit for human habitation.

The leases of some Corporation property in a locality in the north-west part of the City having recently fallen in, a clearance of an area of houses of a very bad kind was determined upon, in view of carrying out a street improvement. On a portion of this cleared area in Barrack-street the Corporation have agreed to erect a block of dwellings for workmen of the poorer kind. A loan of 50,000*l.*, for the purpose of providing dwellings has been sanctioned by the Civic Council, and it was proposed to expend a sum of 25,000*l.* this year. Municipal intentions are sometimes very good, but Corporate projects take a long time before they are realised in Dublin. New street openings and improvements promoted several years ago are not practically begun yet; still, we shall be pleased to hear of the commencement and completion of the proposed block of workmen's dwellings in the Oxmantown district, with a repetition of the same work for other poor quarters of the city north and south.

Forbidding-looking and barrack-like blocks of houses have been erected for workmen by artisans' dwellings companies some time back in Buckingham, Echlen, and other streets in the northern and southern parts of the city, but from an examination of them we can say little in their favour, either on the score of room-space, comfort, or amount of rent. The houses, however, erected on the area cleared in the Coombe district, and leased to an artisans' dwellings company, form an exception to the usual class of industrial dwellings. On this area are built four classes of houses,—one-story cottages, containing one living-room and one bedroom; cottages containing one living-room and two bedrooms; two-story cottages, containing two living-rooms and two bedrooms; and again some containing one large sitting-room and two bedrooms. The first two classes are built of Portland cement concrete, the front walls being 8 in. thick. The third kind have front walls of red brick, and partitions and yard walls of concrete; and the fourth class have front and end walls of brick, and the remainder in concrete. Sanitary accommodation and other requirements have been fairly provided for in the houses erected on the Coombe area. For the two classes of one-story cottages, the rents charged are respectively 3s. 6d. and 4s. per week; 6s. 6d. and 7s. for the four-roomed two-story houses; and 5s. 6d. for the three-roomed houses. Six out of the 210 houses in this area are used as shops, and the remainder by tenants of various trades and callings. The rental received for these 202, excluding those used by caretakers, is 2,680*l.* per annum, and we were informed that bad debts are practically non-existent.

The Coombe district before the commencement of the present century was a prosperous locality, occupied to a great extent by silk and cloth merchants, and a thriving weaving trade flourished there for many years, founded by a Huguenot settlement. This south part of old Dublin has gradually decayed, and ruin and squalor are now widespread over a district once ripe with opulence and trade. The clearance made for the erection of the cottages we have described has led to the improvement of that particular portion of the district. Some years ago the Government valuation of the Coombe area was only 424*l.*, and average total rates paid yearly, taking the three years ending in 1878, amounted to only 63*l.* At present the valuation is 1,429*l.* 15s., and the total rates paid in 1883 amounted to 611*l.*

The clearances of areas for improvements are costly not only in London, but, allowing for the altered condition of matters, in Dublin they are also costly. Preposterous claims are put forward by landlords and tenants in respect to a class of house property which, if the Sanitary Acts were rigidly enforced, would have been

* See p. 371, *ante*.

declared unfit for habitation. A nominal sum would be amply sufficient compensation for a large number of landlords who own wretched tenement property, and who systematically neglect for years to expend a shilling in repairs or in the abatement of the nuisance their neglect occasions. Another unhealthy area, known as the Plunket-street area has recently been cleared by the Corporation, and is ready for building operations. A portion of this area could also be utilised for the erection of workmen's dwellings or houses for the very poor. Over-crowding exists still to a considerable extent in tenement houses, and particularly in the houses in back streets, lanes, courts, and alleys north and south of the Liffey. The large back offices, coach-houses, lofts, and stable buildings attached to houses that were once and not many years ago occupied by wealthy private families have in various quarters been converted into dwellings, and are tenanted by the poor. The passers-by in the front streets are, for the most part, unconscious of colonies of such a class of poor dwellers in their midst, yet in whilom stable buildings many hundreds of these vegetate and die, starving on one meal a day, and hiding their rags on Sunday. Indeed, the old proverb is still true to the letter, that "One-half of the world does not know how the other half lives"; and in many cases we fear we might add, does not care to know.

The Artisans' Dwellings Company, we may observe, are erecting a large number of cottages, having procured sites at Portobello, Harold's Cross, and Rutland-street. We examined a number of these short streets of cottages situated on the banks of the Grand Canal at Portobello. Some of these two-storied cottages have only three rooms, one on the ground-floor, and two above. The four-roomed cottages are 8s. per week, and the three-roomed 6s. The walls are chiefly of concrete, the fronts alone being of red brick. Though an improvement on the ordinary class of tenement dwellings, we consider these cottages are deficient in necessary domestic accommodation in respect to wash-houses, scullery, &c., provided in industrial dwellings in London and suburbs. The rents are also two high for the accommodation provided, and this is particularly the case in respect to the three-roomed cottages. We do not admire the planning of these cottages. When the door is opened (we will not say hall-door, for there is no hall), the fireplace, and nearly the whole room, is exposed to the sight of each passer-by without. It is somewhat remarkable that Irish cottage dwellers, whether living in the streets of a town or in a straggling country village, are fond of keeping their front-doors open even after nightfall.

Considering the very large number of tenement houses that exist all over the city, once in the occupation of private families, the question may be asked, is it not possible to make structural alterations in hundreds of these houses, and fit them for the needs of the industrial and working classes? Without any expensive structural alteration, save by the provision of necessary sanitary accommodation, a large number of these tenement houses could be made suitable for the healthy and comfortable habitation of the industrial poor. Of course there are hundreds of these tenement houses so dilapidated, and so fouled and impregnated with the seeds of disease, that no system of reparation could effect their cure. As they are a standing menace to the public health, their demolition is called for. The number of houses unfit for decent habitation in Dublin probably falls little short of 10,000; and in respect to these a very moderate estimate of the number of persons contained in them would run the figures up to 100,000. If even this number of persons have to be housed in a healthy manner, what machinery exists for doing it? Is the Corporation of Dublin willing to do its share in the work of properly re-housing the poor? When, we would ask, will the Artisans' Dwellings Company meet the urgent want? This company tells the public that when they have completed their present arrangements they shall have covered with buildings nineteen acres of ground, and accommodated nearly 6,000 persons. It would take a dozen of artisans' dwellings companies working for several years to provide for the admitted want; but, at the same time, it is not desirable that Dublin should be converted into a city of artisans' dwellings, and that the Corporation and citizens should close their eyes to the fact that miles upon miles of streets of well-built private houses and mansions have drifted and are still drifting into use as tenement dwellings. It behoves the Corporation of Dublin, as a body, to grapple with the difficulty in respect to this decaying class of house property, and to see that it is utilised in a sanitary way by the new and jobbing class of landlords who have and are obtaining possession of it. There are a number of respectable citizens and traders who say it is madness to encourage the operations of artisans' dwellings companies while such a mass of house property as we have indicated is not utilised to some extent for the healthy habitation of the people. For ourselves, we would not discourage, but rather favour, the erection of well-planned artisans' and labourers' dwellings here and there in the city and on its borders, but we are decidedly of opinion that persistent efforts should be made on the part of the municipal authorities to keep the city respectable. If streets of houses must drift into tenement dwellings, surely, under their new conditions, the Corporation can make their landlords keep them in a habitable state and provide the necessary sanitary requirements of civilisation for their occupants? It was more than once, during our visits to the homes of the poor, pointed out to us that certain members of the Corporation or the Public Health Committee were also shareholders in the Artisans' Dwellings Company, while others were large owners of low tenement house property, and that it was incompatible with the proper exercise of the public duties of those members that their private interests should enter into the question of housing the poor.

According to a sanitary survey of the city made in 1882, at the instance of the Executive Officer of Health, it is stated there are in Dublin 7,284 houses occupied by two or more families coming under the denomination of tenement dwellings. In addition there are 6,000 small houses, houses in the yards of larger houses, and cottages occupied by the poorer classes, said to be subject to periodical sanitary inspection. There are 88,116 rooms in the tenement houses, and they are occupied by 32,202 families, or more than three-fifths of the total number of families in the city. According to this enumeration, the greater number of families in Dublin occupy each one room and a half on the average. These figures are suggestive indeed, and their bearings and results are obvious. There is, however, good reason for believing that the above figures are a good deal under the mark, and that the evils they point to are more widespread. It may be well to add here that the municipal districts, or city of Dublin proper, comprise an area of 3,754 acres, and at the date of the census in 1881 contained a population of 249,602, or, estimated up to the middle of last year, about 250,557, being at the rate of 65·8 persons per acre. In 1881 the city was returned with 24,211 inhabited houses, 3,060 uninhabited houses, and only 316 in course of erection, making a total of 27,587 houses.

Within the last few years a cousiderable improvement has taken place in the general drainage of the city, long lengths of new sewers being constructed to replace the old and most defective ones that existed, but the house drainage in sundry places north and south of the Liffey is very bad, and in spots non-existent. In the northern and southern suburbs a low-class speculative house property has been run up, and operations are still proceeding. We fear that the erection of these buildings obtains very little inspection on the part of the local authority. We found bad materials and workmanship, and also scamped drainage in abundance. The Building Act appears to be violated in several instances, even within the municipal boundary. These houses are made to assume a "neat and genteel" appearance in their fronts to catch the eye, but a skeleton lurks beneath. An improvement has taken place in the matter of the domestic scavenging of Dublin, and a large number of the yards or courts of the tenement houses of the city are cleansed daily, but there is much to be done still in this direction and in the general cleansing and scavenging of the town. During the late year scarlet fever and whooping-cough assumed serious proportions; indeed, the former disease has often ravaged Dublin, where it periodically presents an epidemic form. It has proved a formidable malady in London and other great cities, we must admit, as well as Dublin, but the causes of "filth diseases" are not occult, and they were heretofore, to a great extent, traceable, to sanitary neglect in the Irish capital. Besides the carrying out of a well-devised system of main drainage, including the purification of the Liffey, much sanitary and improving work remains to be accomplished by the Corporation, if decay is to be arrested, disease stamped out, and the capital once more made worthy of the country.

ANTIQUITIES FROM SAN.

MR. FLINDERS PETRIE has brought safely home the first and more portable section of his remarkable find at San, — the site of which is some twenty miles south-west of the modern Port Said,—and the Egyptian Exploration Committee may congratulate themselves on the result of his labours. Some hundreds of small articles are on view at the rooms of the Archæological Institute, in the Oxford Mansion (near Regent-circus, on the site of what was Oxford Market), and are open to inspection on the presentation of an address-card. The visitor may be so fortunate as to find Mr. Petrie at the Institute, and will have the benefit of his stores of knowledge on this most interesting subject. The articles are not arranged in chronological order, but in groups as they were discovered. They consist of charms, domestic utensils, and personal adornments,—many of them very minute in scale, most of them of rare beauty, and all of the greatest interest. They were found at depths varying from 20 ft. to 30 ft. from the surface, and their separation from the *débris* in which they have lain for centuries must have been a work of great care and nicety. By far the most beautiful amongst the objects displayed are the glass mosaics, exquisite alike in design and colouring, and so microscopic in their dimensions as to be only properly seen by the aid of a magnifying-glass. Next to these in attractiveness are the small silver figures, worn as charms, modelled with extreme delicacy. After these the terra-cotta fragments, adorned with ornament in relief, of which the vine-leaf is the most prominent feature, must be classed. Some terra-cotta pateræ of several colours, arranged in geometrical designs, are extremely interesting as art, and interest deepens into wonder when we learn that they date from about the year 1200 B.C. The treasures found in one house comprise a statuette of its owner, Bak-akhu-in, who was evidently an art patron and æsthete of the period. In particular, a bronze lamp, with a long curved neck, for suspension from the ceiling of his house, may be noted as an evidence of his taste.

Of greater interest to the architect than trinkets, however rare or beautiful, is a bronze window lattice, which is believed to date from the fifteenth century B.C., and to be the only one of the kind hitherto met with of so early a date. The fragments are arranged to show the general design, and measure, as so disposed about 18 in. by 9 in.; but there are portions of the same lattice laid loosely about, which, if pieced together, would form a much larger panel. The sides and one end only have been discovered, and it is evident that this identical panel was a very long one. Hence the suggestion that it was placed along the upper portion of the enclosing wall of a hall or other apartment as an internal screen to the "clearstory" by which such apartments in Egyptian structures were lighted. The pattern is a mere reticulation of thin flat bars placed at an angle of 45 deg. with the enclosing frame. The bronze

nails by which it was attached to a wooden frame are laid beside it. Indeed, nails of all sorts and sizes, and bearing a strange resemblance to their modern counterparts, form a considerable portion of the exhibition, and divide the attention with keys, hasps, and staples,—one of the latter specimens having a knob to receive the blows of the hammer, and protect the eye from being bent out of shape.

Amongst the exhibits are some small bronze capitals, probably connected with a shrine or similar structure. They are quite destitute of ornament, and resemble the iron capitals at the Oxford Museum to which the wrought-iron ornament is affixed. The mouldings are not in the least suggestive of Egyptian work, and are, in fact, without any character at all. Other fragments of architecture are adorned with incised ornament of delicate design and workmanship, or with applied decoration in the form of glass mosaic.

A glass lense, some 2 in. or more in diameter, is held to be a great rarity, and the glass and porcelain objects generally, both in respect of the shape and colour, are of exquisite beauty.

A quantity of cloth ornamented in simple colours (in which red predominates), and which clearly shows the aptitude of this remarkable people for art in all its forms, is disposed about the rooms, and the gentlemen who are distressed at the failure of the Chinese hair-crop (*vide* the *Times*) may be curious to see a specimen of human hair 2,000 years old, which belonged to the lady whose cerements were furnished by the cloth in question. The hair is long and wavy, of a rich auburn colour, and apparently as perfect as when its owner proudly wore it. There is no end to the themes for wonder which this collection provides. Mr. Petrie is about to return to Egypt for the terra-cotta, granite, and other specimens which form the bulkier part of his collection, and which will probably find its way before long to the Egyptian section of the British Museum.

If we might venture upon a suggestion in the re-arrangement of these curiosities, it would be that the dates of the several objects should be stated in figures, and not by references to dynasties. Outside the charmed circle there are not many wondering spectators who can attach any meaning to dates concealed under such dynastic hints; and it is the extreme antiquity of many of these objects which constitutes their claim upon general attention. By all means let the learned keep to their own occult system; but let their weaker brethren have the benefit of a translation of the otherwise insoluble chronological enigmas.

NOTES.

AN exhibition of Women's Industries is to be held at Bristol early in January. The idea of the promoters, we are told, is to bring together specimens of work requiring skilled training, so as to illustrate the part taken by women in various arts and manufactures demanding special technical and artistic training, professional and not amateur work being desired. Among the class of exhibits which it is desired to exemplify are painting, sculpture, wood-engraving, wood-carving, modelling, designs for articles of household furniture, designs for decorative work generally, and for textile fabrics, lace, needlework, &c. The loan of ancient needlework and of other articles "representing the occupation of women in past times" is also invited; and it is hoped to form a loan collection of portraits of eminent women, and relics of interest connected with them.* The special motive for all this appears in the footnote to the prospectus of the exhibition, stating that the proceeds derived from the exhibition will be handed to "The National Society for Women's Suffrage,"—for the promotion of women's suffrage, we presume, is what was intended to be said. That the exhibition will excite a great deal of interest, and contain much that is worth looking at, we have no doubt. As far as the more distinctly artistic side of the programme is concerned, however, the subjects of painting, sculpture, engraving, &c., we can only repeat what we have said before in reference to the female art-exhibitions in London, that no good is done either to women or to art by any endeavour to set up art-exhibitions for women alone. The few women who have really achieved a high place in the higher arts have contended with, and prefer to be ranked with, other artists, without distinction of sex; and all the women's art-exhibitions we have hitherto seen have resulted in a display of artistic mediocrity. If women have attained sufficient power in art to take a high stand in it, let them do so as artists, not as women. If they have not attained such power, they have no right to expect compliments for their efforts merely because they are women.

* Communications in regard to the Exhibition are to be addressed to the Hon. Secretaries of the Exhibition of Women's Industries, 20, Park-street, Bristol.

AT a meeting of plumbers in reference to the proposed plumbers' conference, reported in another column, it was remarked that an ordinance of Edward III. had provided that no one should meddle with such a trade unless he had the testimony of the best and most skilled men in the city that "he could well and completely do his work." The feeling of the meeting was that such an ordinance, now practically obsolete, was exactly what was wanted in the present day. Many persons will no doubt entirely approve, as we do, of the attitude taken by the plumbers' meeting in that respect. But it is, as Pepys would have said, "mighty curious" to see how plumbers may take such a line with the support of outsiders, while architects, if they attempt, through their representative corporate body, to protest against incompetent persons being employed on architectural work, are only regarded with indifference or twitted with self-interested motives. The inference is that the public care about plumbing, but do not care about architecture.

A PAPER has been recently read before the French Engineering Society on "Ancient Metallic Architecture," by M. Normand, the architect who restored the Vendome Column, the subject of which was the employment of metallic architecture before the Christian era. He shows that there are evidences of its use, not only in the details of public and private edifices, but also in the erection of buildings in which almost the whole structure was of metal. Columns of iron and bronze were used in many of the Assyrian and Jewish monuments, and some metallic beams of the Roman Pantheon were remaining in the sixteenth century. Metallic joists and terra-cotta panels were also used in ceilings, much as they are in modern buildings.

WE have received a revised edition of the "Practical Suggestions" made by Sir Robert Rawlinson, C.B., and issued by the Commissioners in Lunacy, in reference to the sewerage, drainage, water-supply, &c., of lunatic asylums. These suggestions have been carefully rewritten by the author, and, as may be inferred, they contain a great many useful and necessary rules applicable to town-houses and public buildings other than asylums. It may be noted that an outlet-sewer for the largest asylum need not exceed 12 in. if of earthenware, and 9 in. if of cast-iron. The Commissioners, from their experiences, stipulated "No brick sewers. No sewer larger than 12 in. diameter." Sewers larger than necessary are not only more costly, but they are in a degree mischievous, as liable to accumulate silt. There are large houses in the country,—and in towns also,—built, say fifty or a hundred years since, under which there are brick sewers 5 ft. high by 3 ft. 6 in. wide, flat-bottomed, and branch barrel drains of brick, rude in construction and porous as to material, from 3 ft. to 12 in. Rats swarm in all such sewers and drains. In small well-formed sewers of earthenware or cast-iron pipes, rats cannot exist. The presence of rats about dwelling-houses, either in town or country, is generally a sign of defective sewering and draining, and means bad health to the occupants.

THE old moss which is found in beds of more than 1 ft. thick in various places in Norway and Sweden has been found to be an excellent material for the manufacture of paper, even in its half-decomposed state, and card-board has been made from it, some leaves of which are ·787 in. in thickness. It is as hard as wood, and can be very easily dyed and polished. There is no reason indeed why this product should not in some cases be substituted for wood with advantage, for it possesses all its good qualities and none of its defects, and can be used in the manufacture of doors and windows, cornices, and many ornamental portions of a house, while under the hydraulic press it receives a consistency and power of resistance far superior to those of straw-board.

M. CHAMBERLAND, the director of M. Pasteur's laboratories, has been endeavouring to find, for the very delicate experiments carried out by M. Pasteur, a filter which will absolutely purify water of all, even the most infinitesimal, germs or "microbes." He claims to have found it,—and we may place every reliance on testimony coming from such a source,—in the shape of a biscuit porcelain tube through which the water is slowly forced under pressure. The following further details are extracted from M. Chamberland's account of the filter:—"All previous forms of apparatus called filters, invented up to the present time, have been confined to clarifying the water; that is to say, they retain matters in suspension, but do not in any way arrest the morbid germs contained in all liquids. Water, filtered by M. Chamberland's process, is the same as when taken fresh from the spring; spring water being, as is well known, absolutely free from microbes. This filter may thus be said to constitute a spring at home. The apparatus consists of a tube of biscuit-baked porcelain, closed at one end, and having at the other an enamelled porcelain ring in it, with an aperture for the discharge of the water. The tube is placed in another metallic tube, which screws on to the top, soldered to the water-pipe. A nut placed at the bottom of the apparatus, and screwed up by hand, allows of the space between the metallic and porcelain tube being hermetically closed by the aid of an indiarubber washer attached to the enamelled ring. When the tap is turned on the water fills the vacant space between the metallic and the porous tube, or filtering-rod. It filters slowly under pressure from the outside to the inside, by these means being relieved of all solid matter, including any microbes or germs it might contain. With a pressure of about two atmospheres one obtains, through one single porous tube or filtering-rod (8 in. long by 1 in. diameter), about five gallons of water per day, which seems to be sufficient for the ordinary purposes of a household. The greater the pressure the more filtered water can be obtained. By multiplying the number of rods and coupling them together in batteries it will be easy to obtain the water-supply necessary for schools, hospitals, barracks, hotels, &c."

LAST week we witnessed a trial, at the Health Exhibition, of Fyfe's patent "columnar valve" hydraulic ram, which claims, by the arrangement of the valves and their adjuncts, to obtain the greatest possible result with a minimum of head. Upon the occasion of our visit, two of these rams,—one a double-action and the other single,—were arranged with falls of 5 ft. and 1 ft. respectively, and the delivery-pipes were carried to the top of one of the highest buildings in the grounds. With the greater fall a lift of 92 times the head was attained, whilst 157 times the fall was recorded with the minimum head. Again, with a fall of 5 ft., and an expenditure of twelve gallons of water, 1,592 gallons per minute were raised to a height of 42 ft. We are not prepared to endorse the confident statement of the inventor that these machines "are able to raise water to almost any height, and from any place where a few inches of water can be obtained," because there are many conflicting circumstances in

connexion with placing these motors that would not prove so favourable as those under which we saw them. Nevertheless, we fully believe that an average lift of 60 to 70 times the head may safely be depended upon, and in some cases even greater. The action of the ram is exceedingly regular, and the valves are guaranteed to last four years, with which exception the machines will work automatically for a considerable length of time.

A GERMAN mechanic has discovered that damp parchment paper, when strongly compressed, forms a homogeneous and unctuous material, which has great rigidity and toughness. Observing that when exposed by its cut edges to the friction of a smooth metallic surface it undergoes but an insignificant amount of wear, he took out a patent for the manufacture of journal boxes from compressed parchment paper, one great advantage of this being that lubrification can be produced by water alone. A slight greasing with oil is sufficient to prevent rust.

THE report of the Medical Officer of Health for Clerkenwell for the past year, which has been forwarded to us, contains very bitter words against the Home Secretary and Sir Charles Dilke, the latter of whom has called Clerkenwell a retrograde parish, while the former has expressed a general want of faith in vestry government and (apparently) in that of Clerkenwell more particularly. The report includes a handbill which the vestry drew up when cholera was considered imminent, earnestly advising the inhabitants to take certain precautions specified, all of which appear to be proper and needful cautions; 10,000 of these were distributed, arrangements were made with the Local Government and the Hospital Boards for hospital accommodation and ambulances, and a map was prepared showing where cases would be received in the event of an outbreak. "Fortunately, we have so far been spared; yet the arrangements are still in order. How, in spite of what was then done, and what has always been done, under similar circumstances, Sir William Harcourt could assert, in the House of Commons, that in the event of an epidemic occurring in the metropolis, there was no uniformity of action and no central guiding power over the vestries and local Boards, seems to me only intelligible on the plea that he is a special pleader in a cause." The vestry have, perhaps, some right to feel ill-used; but their statement does not prove that there was a central guiding power, but only that, in their opinion, they did not require one.

IN regard to the taunt about the "retrograde parish, the medical officer of Clerkenwell makes some statements as to the real foundation for the charge, which may be worth the attention of those who legislate for the poorest class of house property and tenants. He says, —"For some years past many of the well-to-do residents of the parish have been gradually leaving their houses, which become occupied by a poorer class of people, many of the houses which were formerly held by one family being now let to several. When these poorer and rough people, especially the labourers, enter a house, at once begins a course of dirt and destruction. The locks and handles of the doors become toys for the children, and are soon demolished. The drain-traps are sold at the bone and bottle shops, those left are never kept on, the closets are stopped up and the pans are broken. The chimneys are never swept, so that the rooms become black and disfigured. The paper is torn off the walls, the floors and passages are never washed, and there are no door-mats, so that the whole place becomes a mass of dirt and destruction. The water-butt lids and the dust-bin lids are used for firewood, the ball-cocks are broken off, so that there is great water waste, which floods the yards and washes away the cement from the paving. The very handrails of the staircases are broken away, and even the walls are picked out with nails, or something of the kind, so as to leave large holes. The windows are constantly broken and stopped up with brown paper; in fact, there exists in every parish a juvenile window-breaking club, the members of which demolish every pane of glass they can, especially in empty houses." With such a class of tenants (and we suspect the account is not exaggerated) the prospect of being otherwise than a retrograde parish is certainly, as the Report observes, "not favourable."

A RECENT number of the "Transactions of the American Society of Engineers" contains some notes by Mr. E. B. Dorsey on "the comparative liability to, and danger from, conflagrations, in London and in American cities." The fire average of London, it appears, is very low as compared with that of New York (taken as a representative American city), and Mr. Dorsey was at first under the impression that the difference must be due to the superior efficiency of the London Fire Brigade. Further investigation, he says, led him to the conclusion that the American Fire Preventive Service was not inferior to the English, but that the circumstances were very different. The damp climate and consequent saturation of wood in London is an element in reducing the liability to fire; and, in addition, the author gives the following list of favourable circumstances in London :—

"1st. The small size of most of the houses, which confines the fire to a very limited space between brick walls.

2nd. The low, strong and well-braced walls, which enable the firemen to approach them without danger.

3rd. The high and effectual fire-walls between adjoining houses.

4th. The great benefit derived from the houses being low and small, enabling the firemen to throw water easily all over them, and with a very short ladder to reach the roof. And also avoiding the great draught drawing the fire up the stairways and wells of high buildings.

5th. The use of more brick and less wood in buildings.

6th. Absence of all frame buildings.

7th. Absence of all wooden additions, outbuildings or fences.

8th. Fire-proof roofing.

9th. Absence of ash barrels or boxes.

10th. The moist or wet climate, which prevents sparks or weak flame from igniting wood.

11th. The parks and Thames river, which divide the city into distinct fire divisions.

12th. The numerous parks, squares, private grounds, wide streets, railroads, &c., all of which are effectual barriers to the extension of fire.

13th. The mildness of the winter climate.

14th. The great care of the authorities in prohibiting the manufacture or storage of combustible materials, &c., in the populous portion of the city.

15th. The very few telegraph wires in the streets above ground to interfere with the work of the firemen.

Contrast the preceding with New York, with its numerous wooden buildings, wooden or asphalt roofs, buildings from four to ten stories high, with long unbraced walls, weakened by many large windows, containing more than ten times the lumber the average London house does, and that very inflammable, owing to our dry and hot climate; the five and six-story tenement houses, with two or three families on each floor, each with their private ash barrel or box, kept handy in their rooms, all striving to keep warm during our severe winters; the narrow streets and high buildings, with nothing to obstruct the spreading of a fire except a few small parks; the perfect freedom with which the city authorities allow in the most populous portions of the city large stables, lumber-yards, carpenters' shops, and the manufacture and storage of inflammable materials; the absence of high or effectual fire-walls between buildings."

NOTES AT THE IRON AND STEEL INSTITUTE MEETING.

AT the autumn meeting of the Iron and Steel Institute held this year in Chester, the "visits and excursions" were really the principal features of interest. Of these probably the most interesting excursions were the visits to the salt-mines at Northwich and the Weaver navigation. They were taken on the Thursday, and the Festiniog Railway and slate quarries, on the following day. A few years ago the Flint Alkali Works would also have afforded a point of great interest as a part of the programme, but the great changes that have been for some time taking place in this industry have shifted the centre of attraction to another spot. The proprietors of those chemical works that would afford information of the greatest interest and value to the chemist and engineer are keeping their doors resolutely shut, and indeed most carefully guarded, being fearful no doubt that prying eyes might discover a means of sharing in the enormous profits that are now being made in this branch of industry.

Amongst the establishments open to the inspection of members during the week were the well-known lead works of Messrs. Walker, Parker, & Co., and also the Hydraulic Engineering Company's shops.

At Saltney were to be seen Messrs. Wood's anchor works. At this establishment some of the largest anchors in the world have been produced in times past, those of the *Great Eastern*, the largest of which weighed 7 tons, each, having been forged here. Messrs. Wood have now in hand the anchors and chain cable of the last new Cunard liner, so they can claim to have made the holding tackle for the two largest ships that have ever been built.

The Dee Oil Works, which are also at Saltney, are well worth a visit. Here may be seen the process by which petroleum refuse is made into lubricating oil, by means of distillation and filtration. This company makes a special feature of manufacturing that particularly fine description of oil required for certain classes of textile machinery. In order to make a lubricant fit for cotton spindles every particle of paraffin wax must be extracted, and this can only be done effectually by subjecting the mixture whilst in the filter press to a very low temperature in order to solidify the softer wax. At the Dee Oil Company's Works there is an important installation of refrigerating machinery on the ammonia system, which is used for this process. The wax expressed is made into candles, the part of the works set apart for this purpose forming an important branch.

The Sandycroft Foundry and the Mostyn Ironworks were also open to inspection. The former is about five miles from Chester, and well worth going to, especially for those interested in mining affairs, as the Sandycroft firm devote their attention principally to mining machinery. The Mostyn Ironworks are twenty-one miles away, and are small and unimportant compared to the vast establishments of South Wales that were recently visited by the Mechanical Engineers during their summer meeting. The Mostyn works are, we believe, engaged solely in the production of Spiegeleisen.

From our own special point of view the lead works and hydraulic engineering works were of the most interest.

The firm of Joseph Walker, Parker, & Co., has works at Chester, Newcastle, Liverpool, Glasgow, Bagillt, and London, most of which are establishments sufficient in themselves to constitute a fairly important business. The Bagillt works are situated in North Wales, on the estuary of the Dee, and about seventeen miles from Chester, on the Chester and Holyhead Railway. Here the first processes of procuring lead from the ore are carried on by means of smelting in ordinary reverberatory furnaces after the manner usually followed in North Wales. There is at these works a flue of rather larger size than is usually met with. It is somewhat under two miles in length, and is arranged in a continuous spiral on a conveniently elevated plateau at the back of the works. It is built of brick in the ordinary way, and is of oval section, 7 ft. high, and 6 ft. across in a horizontal direction. Into this flue are led all waste furnace gases which have been brought in contact with metal in process of reduction. The flue-dust which is carried over with the smoke and products of combustion is deposited during its passage through the long winding flue. The latter, at stated intervals, is flushed by water when the flue dust is carried through and is collected by allowing it to settle in large ponds made for the purpose. The sediment so obtained contains 55 to 60 per cent. of lead. This, under the old system, would have been impartially distributed over the adjoining land to the complete destruction of any crops that might have been attempted to have been grown in the immediate neighbourhood. At the present time such vegetation as is to be seen is as green and pleasant as it can be expected to be within a short distance of a manufacturing centre. The large flue naturally occupies a great deal of land which is, perhaps, not an object of great importance at Bagillt. The principal difficulty in an arrangement of this nature is to get the dust to settle without at the same time sacri-

ficing the draught required for the furnaces. At these works there is a chimney over 250 ft. high and 12 ft. in diameter, and the additional height required to compensate for so long a flue must be considerable. We do not know whether there is any special reason why the necessary space required for the settlement of the flue-dust should not take the form of large chambers. These would occupy far less ground, whilst the rapidity with which the fumes would travel would be far less. Naturally in a flue which has the same sectional area throughout the gases will travel at approximately the same speed, and it is this speed which delays the deposition of the suspended particles of dust. Possibly, too, if chambers were used a better means of abstracting the flue-dust than the somewhat primitive one of flushing by water might be devised.

The furnaces used for smelting lead are generally about 20 ft. long and about 10 ft. wide. There are doors on each side, and the hearth is made up of slag. About a ton of ore with 2 cwt. of flue-dust is the usual charge at Bagillt. The reduction is by air, the furnaces in which ordinary coal slack is burned being placed at the sides and delivering the flames above the charge on the hearth. As the metal forms during the process, at which time the charge is well worked by hand, it flows towards the tap-hole and ultimately runs out and is cast into pigs. About ten per cent. of the metal remains in the slags left after the first working. In order to recover as much of this as possible the slag is worked up again, and in this way a hard inferior description of lead is obtained. There is an exceedingly well-arranged desilverising plant for the zinc process at Bagillt, which has recently been erected under the superintendence of Mr. W. M. Hutchings, the manager. The melting-pots are 6 ft. 5 in. in diameter. This plant is capable of producing over 600 tons of lead per week, whilst the annual output of silver at these works is about 13 tons a year. Litharge and red lead are also made in large quantities at these works. Red lead is, as is well known, an oxide of lead. The first process of manufacture is carried on in "drossing-ovens," of which there is a large number at Bagillt. These are of the ordinary bee-hive form, with a rather high dome in which the smoke and gases from the furnace collect until they pass out at the working door and are carried off by an uptake conveniently placed. The pigs of lead are melted on the floor of these ovens, the molten metal being kept from running out by a dam composed of the refuse from the last working. Antimony is introduced into the bath, and the whole is kept agitated by hand-rakes. In process of time,—about six hours,—the greater part of the lead has become oxidised, and the remainder is allowed to run away to be recast and used again. The "dross" is left in the oven and kept at a high temperature, and is then ground and levigated, after which it is subjected to further oxidation in other ovens in order to improve the colour. After a further process of levigation and grinding the material only requires drying in stoves in order to become the red lead of commerce.

Sheet lead is rolled at these works, there being a rolling-mill capable of producing sheets up to 100 in. wide. A pair of cast-iron rollers, 23 in. in diameter, are mounted in cast-iron standards, and have a long bench with loose rollers on each side for working the sheets upon. There are also a couple of live rollers worked by spur gearing, close to the mill on each side, for the purpose of feeding-up the sheets. The rolls are driven by a separate engine, and the reversing is effected by a clutch gearing on to the bottom roller, which is the driven one, the top roller running loose in its bearings. When a sheet has to be rolled a slab of metal is cast, and a piece of the necessary weight, according to the gauge and area of the sheet required, is cut off. This is passed through the rolls whilst quite hot, and is gradually reduced in thickness and extended in area as the operation proceeds, until finally it becomes the familiar sheet-lead which is used for such a large variety of purposes. At each pass the top roll is brought closer to the other, its journals and their bearings being lowered in the framing by suitable hand gearing.

At the Chester Works of this firm white-lead making, pipe-drawing, and shot-making are the principal occupations. The shot are dropped from a tower in the ordinary way. The globule of molten lead assumes its spherical form as soon as it leaves the perforated tray, known technically as a card, through which it is allowed to percolate, and hardens during its descent, when it is finally caught in vats containing water, in order to prevent injury through falling from so great a height on to any hard substance. Larger shot are cast in moulds. At the Chester Works there is a large plant for drawing lead-pipe, consisting of several hydraulic presses and the necessary gear for working them.

A press for making solid drawn lead pipe consists firstly of a hydraulic ram and cylinder, the former pressing upwards in a vertical line. On the upper part of the press there is a cylindrical vessel with which molten lead is poured and a die of the same diameter as the pipe to be drawn is then firmly wedged into the upper part of this cylinder. An iron core of smaller diameter than the hole in the die is placed concentrically to the latter, and an annular space is thus obtained, through which the lead is forced by means of the head of a ram which fits the bottom of the cylinder containing the lead. It will be manifest that the outer diameter of the pipe is regulated by the diameter of the die, whilst the thickness of metal is dependent on the size of the core. In order that the lead which comes in contact with the walls of the cylinder may not be chilled when it is first poured in, small fires are made up in receptacles provided for the purpose, or, in the case of larger presses, the cylinder is bodily heated by being placed in a gas-heated chamber. Considerable judgment is required on the part of the operator in determining when the lead is at the right temperature for the purpose. Should it be too soft it will run out in a shapeless mass, whilst if allowed to set too hard it will not work at all. A pressure of about 2,200 lb. is obtained in the hydraulic cylinder for the smaller presses, whilst those used for producing heavier pipe work up to 6,000 lb. to the square inch. Pure tin pipes are made in the same way, whilst tinned pipe of lead is produced by pouring a small quantity of molten tin into a hollow formed on the upper part of the die, and also by pouring a small quantity into the first few inches of pipe made as it emerges upwards from the die. This tin remains molten for a considerable time, and deposits a thin layer on both the outside and inside of the leaden pipe as it is formed.

Solid round lead is formed in the same way as the leaden pipe, the only alteration in the process being the omission of the core.

Lengths of lead of any required section, such as calm lead for glazing, can be drawn in these presses, dies of various descriptions being provided for the purpose.

Water-pipes of all standard sizes are here made as stock articles, ranging between $\frac{3}{4}$ in. pipe, from $3\frac{1}{2}$ lb. to $5\frac{1}{4}$ lb. per yard up to 6 in. barrelling up to 84 lb. per yard. Lead and composition gas-pipe is drawn from $\frac{1}{4}$ in. diameter up to $1\frac{1}{4}$ in. diameter. A special gas-pipe, of $\frac{3}{32}$ in. diameter, is drawn for using in glass chandeliers.

White-lead is made at Chester by the ordinary stack process, in which thin castings or "crates" are subject for several weeks to the corroding influence of the fumes of ascetic acid, damp bark being used to generate the required heat. The product is carbonate of lead, which, having been washed and dried in a stove, becomes the dry white-lead of commerce. Messrs. Walker, Parker, & Co. also grind large quantities of white-lead in oil, having several mills of the ordinary description, and a roller-mill of ingenious construction for the purpose. The ascetic acid used for the production of lead is made on the premises, and there are also appliances for boiling and refining the oil used in grinding the lead into paint.

The Hydraulic Engineering Company, of Chester and Palace-chambers, Westminster, are well known as manufacturers of hydraulic machinery in general; Ellington's patent hydraulic balance-lifts for hotels, warehouses, and private dwellings, being amongst their special productions. These lifts are direct-acting, the ram, which is of the same length as the height of the lift, working in a cylinder placed in a well immediately under the cage, which in every position rests on the column of water beneath it. Lifts of this description have been up till recently mostly worked at low pressure, obtained from the mains of the ordinary water supply, or from a head of water in a tank on the roof. In such cases a large ram is a necessity, and the cage and ram have to be counterbalanced by weights and chains. The dangers that may arise through the failure of such appliances are well known and have received too many lamentable proofs in practical working. It is in order to obviate these risks that Mr. Ellington has introduced his hydraulic balance, and works only at higher pressures. There are several modifications of this hydraulic balance, but they are all arranged on the same fundamental principle. At the side of the lifting cylinder a second cylinder is placed, the ram of which works in an opposite direction to the lifting-ram, so that the balance-ram ascends when the lift is coming down, or descends when the lift is rising. The stroke of the balance-ram is necessarily less than that of the lifting-ram, but the area of the former is greater. In this way the balance governs the action of the lifting-cylinder, and prevents it rising too high or descending too rapidly. It would be impossible, without illustrations, to give a clear idea of the various means by which the principle is fitted to the different conditions of working that may be required, but we hope to be able to refer to the subject again at a future date.

At the present time several lifts on this principle are in course of construction at the works. One order for thirty is being executed for dwelling-houses on the Kensington Court Estate. The power to work these will be supplied by the London Hydraulic Power Company, which is erecting a hydraulic pumping-station in the district. Two more lifts are also being made for the Hôtel Métropole, whilst two others have lately been fitted to the First Avenue Hotel. Possibly, however, the best known of Ellington's lifts is that at the Bedford-street Branch of the Civil Service Stores, which has for several years been carrying on an average 2,000 persons a day without accident or delay.

One of the principal features in the erecting shop at these works is a set of vertical hydraulic pumping-engines that have been made for the General Hydraulic Power Company, and which are about to be erected at this company's principal station at Blackfriars. The engines are of the three-cylinder compound type, having one high-pressure cylinder, 19 in. in diameter, which exhausts into two low-pressure cylinders, each 25 in. in diameter. The stroke is 24 in. Cowey's automatic expansion gear is fitted. This is worked by a governor and a chain attached to the accumulators actuating cams, which in turn operate on a trigger-gear. There are three pumps 5 in. diameter, and of the same stroke as the steam pistons, being, in fact, placed below the steam cylinders, and driven directly from the piston-rods. These pumps will work to the standard hydraulic pressure of 700. Another object of interest in these shops is a hydraulic intensifier, by means of which a water-pressure of 2,500 lb. can be obtained from the ordinary hydraulic main pressure of 700 lb. This is got by the differential action of two rams; one of larger area and lower pressure forcing a second of smaller area to a considerably higher pressure. The apparatus would be of great service for testing purposes in cases where it would not be desirable to work the pumps at the full test pressure.

THE PLACE OF ART IN THE POLITICAL ECONOMY OF A NATION.

This was the title of a paper read by Mr. P. H. Rathbone at the Social Science Congress, Birmingham, last week, and which we now give in full:—

Some years ago I ventured upon a few remarks upon the political value of art to a great nation, but art is many-sided, and has its ethical and even scientific value if properly understood. At the present moment, however, it is perhaps even more important to insist upon its economical value. It is one of the most serious functions of a statesman to strive that the great body of the nation be well clothed, fed, and housed. It is not unnatural that he should ask himself whether it is wise to divert energies which ought to be mainly directed to these important ends, to what has been too much considered as a mere ornament of life. I propose to ask your attention for a few minutes while we try to solve this problem. Art is the logic of beauty and of efficiency. Art, in form and in colour, is the knowledge of how to select and arrange lines, colour, and shades, so as to rest

the eye, stimulate the intellect, awaken the imagination, and last, not least, satisfy the reason. In short, the main object of art is to do whatever we have to do so as to be of most use and give most pleasure. We have been too much in the habit of unconsciously confining the term art to the initiative arts of painting and sculpture, &c., with perhaps a partial exception in favour of architecture, so far as it is considered as an object of beauty rather than of use. Hence many of our errors of taste in regard to architecture. We have taken buildings, eminently adapted for the purposes to which they were applied, and copied them for purposes to wnich they were not adapted. Then we wonder that these copies do not produce in us the same sense of beauty as their prototypes. In the last century attempts were made to adapt Greek temples as mansions, and the owners felt much surprised that a style of architecture suited for large halls lighted from the roof should look heavy and unsuitable when applied to two-story dwelling-houses with a multiplicity of rooms. We forget the original use of sculpture as the enrichment and complement of architecture, and send hapless statues shivering about our squares, without buildings to which they have any relation whatever, and without apparent reason why they should be there, or we stick them up on the top of poles, like bears in a zoological garden, waiting to be fed with buns by the angels. Look, on the other hand, at the Column of Trajan at Rome; there it stands in the middle of a square, completing the square and marking its centre. The record of a series of campaigns is sculptured round the column, which was originally crowned by a portrait figure of the chief actor in those campaigns. Every portion of the column has its *raison d'être*,—its definite relations to its surroundings; but what sense is there in Charles James Fox presiding over a cabstand in Hanover-square, or Victory dispensing her wreaths among the bus-drivers at the bottom of Waterloo-place?

But, it may fairly be asked, what has this to do with the economical value of Art? Much, I venture to think, if we look closely into the matter. For many years we have devoted ourselves, with considerable success, to being the cheap-jacks of the world. We have been able to effect this by the aid of our coal mines, and by the practical possession of the cheapest labour in the world; I do not, of course, mean the lowest priced,—for low wages beyond a certain limit do not mean cheap labour. We must look forward, and that in no remote period, to losing this supremacy. Coal and steam are rapidly supplanting bone and sinew; and the invention of a furnace adapted to anthracite coal might entirely and most rapidly enable America to supplant us in the matter of coal. Let her repeal her insane protection laws, and our manufacturing supremacy, so far as cheapness is concerned, would probably become a thing of the past. If, therefore, we are to maintain our manufacturing position in the world, we must in future learn to manufacture the best and most tasteful fabrics rather than the cheapest. Low-priced articles will, in future, be more and more manufactured on the spot where the raw material is produced,—witness the growth of cotton-mills at Bombay. We shall have to turn our attention to manufactures which increase the value of raw material so much that the freight and carriage become unimportant items; and it goes without saying, that such manufactures must have a large artistic element in them. A few years ago, Mr. Morris devoted himself to introducing sound art into wall-papers, and the general world gently smiled at the æsthetic craze. But what is the practical result? Why, that as a direct effect of his action a large export trade (so I am told) in wall-papers is growing up which did not before exist. It is good wall-papers, not cheap wall-papers, that we are exporting. Look at Nottingham,—its lace manufacture and consequent prosperity; and then inquire into the enlightened amount of thought and energy expended in impregnating the population with artistic feeling.

The history of the potteries is an equally instructive one. Go where you will,—Russia, Italy, &c.,—you will find the remains of old Josiah Wedgwood's pottery in old pawnshops,—pieces of a character which show it must have been exported in large quantities. The common articles in daily use were produced in their most artistic form, because a true study of the principles had taught him, and, through him, other potters, one of the most important lessons of Art,—the adaptation of means to the proposed end, and economy in raw material. Unfortunately, Wedgwood died just at the dawn of that dreary period when the country was dominated by that crass stupidity which was dignified by the name of *plain common sense*; the time when Pitt refused 100,000*l.* to buy the Pitti Gallery, because England did not require pictures. The pottery trade of England declined and languished till the Exhibition of 1851 stimulated the potters to the study of art; and the effect upon the export trade of Great Britain is too well known to be insisted upon. I am told that the firm which has most conspicuously devoted itself to the best forms of art in its manufacture, is also the firm which has suffered least in the present period of extensive depression. I need not insist upon the example of Birmingham, and the work Messrs. Elkington and many others have done here. I ask those who doubt to inquire for themselves, and to ask those manufacturers who have devoted themselves to producing good artistic work what have been the pecuniary results of their endeavours. The artistic education which would have prevented our defacing our towns with absurd and incongruous statues and buildings at outrageous expense would have enabled us to supply Europe with those tasteful manufactures which, until lately, we have chiefly derived from France, where the necessity of artistic education for her workmen has been so long realised.

What more striking instance of the material value of art education could you have than Paris? Here is a city without coal, with an insignificant river, with no natural manufacturing advantages whatever, which supports an enormous population by the taste of her artisans. Her position as capital,—geographically an unfortunate one,—is not sufficient to explain this.

For want of it much highly-paid artisan's work falls into the hands of foreigners, and till the establishment of art schools this was still more the case. Sculptors reside in Italy because they can get marble-cutters there, and it was but the other day that a young artist confided to me his great joy over finding a skilful Italian marble-cutter in London at 5*l.* per week. It is but a few years ago that the best decoration of pottery was chiefly in the hands of foreigners, and we owe much to Messrs. Doulton for their efforts to create an artistic school of British pottery, and put the higher wages paid for artistic work in the hands of our artisans. It was not pleasant some time ago in Liverpool, where we have some of the best bricklayers in England, to find that, when it came to the ornamental and more highly-paid brickwork, artisans from a distance had to be imported. I cannot altogether absolve trade societies from blame in this matter. The objection to having wages regulated in proportion to the skill and industry displayed which they have occasionally evinced is most immoral and demoralising. No language can be too strong to denounce, no laws can be too strong to pitilessly crush any attempt at interference with a free workman's full use of all the skill and industry of which he is capable, or to deprive him of his right to the increase of wages which those qualities deserve. Any action which cramps the growth or energies of the nation is high treason to the country, and should be relentlessly suppressed as such by public opinion and by public laws.

It is not, however, only necessary that our workmen should be artistically trained; they must live in an artistic atmosphere, among a public ready and able to appreciate and criticise their works. I have been told that one of the largest firms of calico-printers finds it desirable that their designers (Englishmen) should live in Paris, because they find by experience that life in artistic and unsympathetic surroundings chills and blunts their designing powers. A poet may shut himself up in his interior consciousness, and develope out of it the sweetest powers of song. An artist, for the most part, requires stimulation from the surrounding sympathy; for he has to express to those around him his sense of beauty and fitness, or else it ceases to be beauty and fitness to him. Nor is it necessary that it should be in the same forms of art as he himself practises.

Nothing is more remarkable than the many-sidedness of the very greatest artists. Michelangelo and Raffaelle were painters, sculptors, and architects; Leonardo da Vinci added music to his other artistic acquirements, and his master, Verrochio, turned from painting to sculpture late in life, and succeeded. Many others tell the same story, and we have among ourselves artists of whom it would be difficult to predicate whether they were more at home with the chisel or the brush, and who would, no doubt, shine as architects were they required to turn their energies in that direction. In the Ober Amergau we find a population of peasants, supporting themselves by wood-carving, who have attracted crowds from all parts of Europe and America to witness their skill in dramatic representation. Through a more thorough artistic education, we should enable our handicraftsmen to turn from an overstocked occupation to one understocked, and render their intelligence and labour more mobile and fluid. Art thoroughly acquired in theory and practice trains the powers of observation, of discrimination, and of selection; trains the eye to accuracy, the hand to prompt efficiency, and gives command over materials. A man thoroughly trained in drawing finds little difficulty in modelling in clay. Only those who have given attention to the subject would guess what varied powers of united knowledge and observation are required to produce any work of art which has any real claim to be so called. This question is deserving of very serious consideration.

At the present moment we are face to face with a very perplexing paradox. The average price of wheat this year has been the *lowest* on record, as we are informed by the *Spectator*. Meat supplies are opening all over the world, and good South American mutton cannot secure more than 6d. per lb. in London, wholesale. Wool and cotton have been, and remain, extremely low. Many, if not most, of our cities are over-built. And yet, with the main necessities of life,—food, clothing, and shelter,—over-plentiful and cheap, the best informed employers are looking forward to a period of more than ordinary distress among industrious workmen during the coming winter. There must be something wrong about this state of affairs. It seems mockery to talk of over-production of food, shelter, and clothing, when so large a proportion of our population are half-fed and clothed, and worse lodged than cattle. It is not so much that more necessaries are produced than are wanted, as that more are produced than can be paid for. Now, what is the reason of this? Doubtless, there are temporary causes which will pass, but I venture to think that there is a permanent cause. Facilities of transport, the development of machinery, have enabled the population of the world to feed, clothe, and house themselves by working much fewer hours a day than formerly. Now, this would be all very well if they did work fewer hours a day, but they do not, and, what is more they will not, at least not to sufficient extent. Let us suppose that the civilised population could formerly furnish themselves with necessaries by working ten hours a day and we can do it now by working seven hours a day. Of course the number of hours is a mere hypothesis, but, I believe, a moderate one. If they all did work seven hours, well and good,—they would have three extra hours to spend for rest, amusement, and enjoyments; but what is the real case? Why, that seven-tenths work ten hours a day, and three-tenths look on with idle hands. What is the remedy? Not working shorter hours: competition will prevent that; and you may as well attempt to sweep back the ocean with Mrs. Partington's broom as to arrest the action of competition. If we were a single nation, thoroughly organised, something might be done, though even then I doubt it; as it is, we are a family of nations, speaking different languages, and with very imperfect means of organisation. What is the consequence? Why, that at the end of the year the seven-tenths have produced sufficient necessaries for the whole community, and that the three-tenths have earned nothing to pay for their share, a large proportion of which, therefore, is thrown back upon the hands of the producers, and we have the curse of over-production amid a semi-starving population. What is the remedy? Surely that the three-tenths should be employed in producing means of making the lives of the seven-tenths brighter, happier, more varied than at present. It is producing superfluities if you will, but superfluities that will do much to raise our workmen from the rank of machines and animals, into that of thinking, reasoning, life-enjoying men. They have as much right to the enjoyment of life as we. Much, no doubt, has

been done, but much remains to be done. At present the means of enjoyment most freely offered them is drink. Can you blame them altogether if they avail themselves of it too freely? But it is said that you cannot force these things upon our working population; certainly not, but let them be offered the option. If it be refused,—and I believe it would not,—then, and not till then, you may accuse our fellow-countrymen of innate sensual instincts. Of course, it will take time. A taste for art requires time to cultivate; but that it can be done we have had satisfactory proofs in Liverpool, and, I have no doubt, you will have even greater in Birmingham, for many forms of manufacture require a nicety of eye and delicacy of hand, which are in themselves the first and by no means least important steps towards the cultivation of a love of art.

In a small town near Liverpool, devoted to chemical manufactures, a theatre has been recently erected, and the publicans complain that when it is open their takings are reduced by a third. Thus a large proportion of the population are kept out of mischief, and remunerative employment is provided for a deserving and hard-working class of men and women; for an actor's life is not the mere play-work outsiders are apt to imagine. Cultivate the taste of our population by art galleries and museums, by concerts and theatres, and they will not only patronise the latter, but they will crave to possess as their own such forms of art to decorate their houses as may be within their means. They will frame the coloured prints provided by the *Graphic* and *Illustrated News*, after our best artists, and photographs of the pictures in our galleries; they will cover their chimney-pieces with pretty and inexpensive specimens in the potter's art; they will fill their rooms with elegant, if plain and simple, furniture; and the very tea-cups and plates in daily use will be, not dearer, but in better and purer taste than has hitherto been the case. Lastly, they will dress their wives and daughters and themselves so as to do justice to one of the most beautiful populations that has ever existed, if we may trust the records of art. Day by day will elevate and purify their taste, till it creates a demand for artistic work that will overflow the limits of the country, and create an export trade which may do much to counteract the loss of that supremacy in mere cheapness, hitherto our mainstay, and a discrimination and judgment in our working population will be developed which we are not yet prepared to consider them capable of possessing.

If you think these ideas Utopian, I ask you to look back some five-and-twenty years, and compare the style of music which was provided for the working men's concerts with that to which they listen now with earnest and intelligent attention; I ask you to note the gradual disappearance of the flaring and ill-assorted colours which used to disfigure the dresses of the working women and those of much wealthier classes; to compare the wood-cuts of the cheap illustrated papers with those of former days, and then deny, if you can, that there has been an improvement in the taste of the nation, which gives every hope for its future progress, and I maintain is a new source of material wealth. If I am right, here is a prospect of supplying the supposed three-tenths (or whatever the proportion may be) of our nation, and of making the lives of the remaining seven-tenths happier, better, and more beautiful than they now are; and so I believe that, looking at the question in a purely material light, and as a source of wealth, putting aside all other considerations, the cultivation of the artistic taste is well worth the statesman's serious attention. It would be worth while to have a committee to inquire what effect schools of art have already had upon the export trade of the country. I believe much has already been done, is doing, and in a right direction, only do not let us relax our efforts. There is, however, one direction to which I do not think sufficient attention has been paid. I think every large town should have a good typical collection of casts of the best sculptures of all schools; not confining it, as has been too much the case, to the Greek and Græco-Roman schools, but including the early Florentine, French, German, and other Mediæval schools. Casts are the cheapest forms in which the best specimens of the highest art can be produced, and so little altered, except as to material, as to be, for practical purposes, almost as educational as the originals.

I wish the subject had fallen into stronger hands, but trust I may have said enough to prove that art has no unimportant place in the political economy of a nation.

SANITARY CONGRESS AND EXHIBITION IN DUBLIN.

The seventh congress of the Sanitary Institute of Great Britain was opened on Tuesday last with an address by Sir Robert Rawlinson, C.B., the President of the Congress. Having referred to the Royal Commission of which he was president, and which sat in 1879 to inquire into the sewerage, drainage, and general sanitary condition of Dublin, he observed that since 1879 the Corporation had carried out various sanitary improvements, but the purification of the Liffey still remained to be accomplished. Sanitary science, he said, was as old as literature. The Book of Leviticus contained laws and regulations for preserving health, and the reasons for some of the ceremonial regulations might be easily understood, such as avoidance of unclean meats, and isolation of contagious diseases,—leprosy for instance. There were at this day what might be termed leprous sites, produced through ages of continued pollution. In the great towns, such as London, hospital surgeons recognised types of disease the most malignant and deadly as coming from special streets, and even houses, and when those streets and houses had been removed, cases of those types of disease ceased. One of the greatest objects of sanitarians was to stem the torrent of sanitary ignorance now working so much mischief and causing incalculable human misery. Quarantine, as now practised, was worked at enormous money cost as well as inconvenience, and produced much misery without having the effect intended. He referred to the antiquity of cholera, which was said to have been known in China as well as India, and to the peculiar conditions and characteristics of the disease in the East. He reminded the meeting that the disease was not so destructive as the ever-present fever under its various forms. Typhoid was answerable for far more deaths than cholera. Unsound meat and impure water might be factors in causing cholera, but were not the sole cause, as these were ever present, and many who died of cholera were not water-drinkers. In some outbreaks the most destitute portion of the population had not suffered, while the artisan class had. The very poor in summer lived mostly in the open air, and drank water.

Referring to the question of sewage disposal, Sir Robert Rawlinson said: — "The work of entirely freeing the River Thames of sewage from Teddington to the North Sea is merely a question of time, and there will be no further tampering with the question in London; and out to sea also must go the whole of the crude sewage of Dublin, because the river Liffey must be purified, and intercepting sewers, having a sea outlet, will be the cheapest remedy. Every large town in Great Britain which is situate on the seashore or on the margin of a salt-water estuary, sends the crude sewage direct to the estuaries or to the sea, and I know no valid reason against it. There are, undoubtedly, manurial elements of value in crude sewage; but if it must cost thirty or more shillings to utilise it by deposition with chemicals, or in land-irrigation, to earn 20s., I fail to see that to dispose of it into the sea at a less cost in rates is waste."

The business of the Congress was continued on Wednesday, when the Registrar-General for Ireland delivered an address on "Statistical Measures of the Health of Communities." Dr. Flinn read a paper unfavourably contrasting the administration of the Public Health Act in Ireland with that in Great Britain. Mr. E. Spencer, M.A., read a paper giving a deplorable account of the condition of the houses of the working-classes in Dublin. He recommended the demolition of old houses; but stated that the improvement of the homes of the working classes did not altogether depend on the provision of suitable abodes, but to a great extent on the education of the people themselves.

In connexion with the Congress an exhibition of sanitary appliances was opened in the buildings of the Royal Dublin Society, Ball's Bridge. This exhibition will remain open until the 18th inst. Many firms well known to our readers are amongst the exhibitors. The judges* have made the following among other awards, viz.:—

Medals and Starred Certificates.

Bradford & Co., London; for washing machines.†
British Sanitary Company, Glasgow; for self-acting earth-closets.†
J. & M. Craig, Kilmarnock; for white enamelled fire-clay ware for sinks.
Doulton & Co., London; for art pottery; ditto, for ventilating tile stoves; ditto, for anti-percussion high-pressure valves.
J. E. Ellison, Leeds, for conical ventilators.†
R. R. Heap, Manchester, for dry earth and ashes closet.†
Maguire & Son, Dublin; for sanitary and domestic appliances.
P. H. Maignen, London; for filtre rapide.†
Musgrave & Co., Belfast; for slow combustion stoves.
J. L. Smallman, Dublin; for Stott's mercury gas governor.†
Shanks & Co., Glasgow; for siphon-action water-waste preventers.
Wilson Engineering Company, London; for their Wilson cooking range.†
J. Wright & Co. Birmingham; for Eureka gas cooking stove, and Silver Medal of the Exeter Gas Company.

Certificates.

Robert Adams, London; for the Norton door-spring, and for adjustable pivot for fanlights.
W. Baird, Dublin; for butler's sink, bath, and lavatory.
David Thompson & Co., Glasgow; for Watt's asphyxiator, for testing drains with smoke.
Bourtreehill Coal Company, Dreghorn, Ayrshire, for stoneware drain pipes; and for white enamelled fireclay sinks.
W. Carson & Sons, Dublin; for Willesden waterproof paper and canvas.
T. Cardingley & Sons, Bradford; for granite concrete pavement.
J. M. Craig, Kilmarnock; for Buchan's disconnecting trap.
Doulton & Co., Lambeth, London; for cheap glazed stoneware sinks; for bath-fitting locking apparatus; for Lambeth combination water-closet; for enamelled-ware open channels for manholes; for manholes for drains with connexions complete; for London-made stoneware pipes; for silicon treads for steps; and for glazed-ware mantel-piece with slow combustion grate.
J. E. Ellison, Leeds; for radiator ventilator.
W. R. Leggott, Bradford; for opener for fanlights and skylights.
Maguire & Son, Dublin; for white enamelled fire-clay sinks; for cast-iron drain pipes coated with Angus Smith's preparation; for Marsden tiling for wall decoration; for new laundry stove and copper boiler; for Scott's self-regulating disinfecting chamber.
Pennycook Company, Glasgow; for their system of glazing without putty.
T. R. Scott & Co., Dublin; for solid oak parquet flooring.
Shanks & Co., Glasgow; for cast-iron baths and porcelain lavatories.
Smith, Elder, & Co., London; for sanitary publications.
T. Twyford, Hanley; for lavatory basins and slop sinks.
T. & M. Craig, Kilmarnock; for white enamelled bricks.
Bourtreehill Coal Company; for white enamelled bricks.
J. Wright & Co., Birmingham; for ventilating open gas fire.
W. Carson & Sons, Dublin; for slow combustion stoves.
T. Twyford, Dublin; indiarubber connexion for joining lead and earthenware pipes.
Arden, Hill, & Co., Birmingham; for gas cooking stove lined with white tiles.

The awards as to a number of other exhibits are deferred.

SURVEYORSHIP ITEMS.

Belfast.—At a special meeting of the Belfast Town Council held recently, Mr. J. C. Bretland was appointed successor to the late Mr. J. J. Montgomery as Borough Surveyor of Belfast. Mr. Bretland has been in the service of the Corporation for the past sixteen years, during which period he has become familar with the duties of the office. The present salary is 500*l.* a year.

Edmonton.—Mr. F. J. Bancroft, who has during the past three years held the post of assistant surveyor to the Finchley Local Board, and who has been engaged assisting Mr. Brumell, the Board's engineer, in preparing plans for the main drainage schemes, has accepted a similar appointment under Mr. Eachus, engineer to the Edmonton Local Board.

Gas v. Coal for Cooking.—At a recent meeting of the Guardians of the St. George's (Hanover-square) Union, it was reported from the Infirmary that cooking by gas apparatus had been tried for three months, the result being a saving of 20*l.* as compared with the cost of coal. The Infirmary Committee recommended that a gas roaster and hot-plate be purchased of Messrs. H. & C. Davis & Co., Camberwell, which was carried.

* Professor W. H. Corfield, M.D., chairman; Professor F. De Chaumont, F.R.S.; Mr. Saxon Snell, F.R.I.B.A.; Mr. Rogers Field, M.I.C.E.; Dr. H. C. Bartlett, Ph.D.; Mr. Ernest Turner, F.R.I.B.A.; Mr. W. Eassie, C.E.; Mr. J. W. Peggs, M.I.C.E.; and Dr. Louis Parkes, sec.

† These recipients would have received a medal each but for the fact that one had been awarded to them on a previous occasion.

ECCLESIASTICAL ART EXHIBITION AT CARLISLE.

In connexion with the Church Congress, at Carlisle, an interesting exhibition of ecclesiastical art has been opened. The loan collection includes 300 exhibits, embracing specimens of ancient and modern embroidery, wood carving, metal work, carved ivories, and other *instrumenta ecclesiastica*. Pictorial art is represented by various photographs and chromolithographs of ancient pictures, illuminations, drawings of churches and ecclesiastical furniture, engravings of chalices, and a large collection of rubbings of monumental brasses and incised slabs, from what is believed to be the oldest known specimen, representing Sir John D'Abernon (A.D. 1277), down to that erected to the memory of the late George Edmund Street in Westminster Abbey. Amongst the books may be mentioned a York Missal of about 1500; an early edition, dated 1596, of Marot & Beza's French Psalter; together with several service books, prayer-books, books of homilies, &c. A striking feature of the collection was an assemblage of disused plate, obtained from various churches in the diocese. It included about seventy pieces, mostly belonging to the sixteenth and seventeenth centuries, many of which were of great interest. The various guilds of the city of Carlisle have also contributed their plate, amounting to twenty-five pieces, or thereabouts: including tankards, porringers, cups, and salvers.

Messrs. Cox Sons, Buckley, & Co.: Messrs. Jones & Willis; Messrs. G. M. Hammer & Co.; Messrs. Heaton, Butler, & Bayne; Messrs. Keith & Co.; Milner's Safe Company; Messrs. John Smith & Sons; Messrs. Ward & Hughes; Messrs. John Warner & Sons; and other well-known firms, were amongst the exhibitors of church furniture, decorations, plate, &c.

While speaking of the Church Congress, we may make mention of the pastoral staff presented to the Bishop of Carlisle. It is the work of Messrs. Barkentin & Krall, of Regent-street, London, the well-known goldsmiths and art-workers in metal. The design was furnished by Messrs. Bodley & Garner. The work appears to be one of much merit, but we have no space for a detailed description of it.

Illustrations.

DETAIL ELEVATIONS OF WAR AND ADMIRALTY OFFICE DESIGNS.

We give, as we promised last week, the detail elevation studies of the three designs which were placed first in the second competition, those by Messrs. Leeming & Leeming, Webb & Bell, and Verity & Hunt, devoting a page to each. These will enable a better comparison to be made between the treatment of the three than could be made from a general view only. We fear such a comparison cannot possibly be favourable to the selected design, which consists of more or less pretty bits with no coherence whatever, and the columnar order is, as used here, as complete a piece of architectural sham as could be seen; a ponderous base, and a great column and cornice carrying nothing but a single statue. The elevation from Messrs. Webb & Bell's design is by far the most refined in detail of the three, but whether any one who saw it executed would take it for a War Office may be a question to be asked. Messrs. Verity & Hunt's elevation, like their general view, suggests "War Office" more than either of the other two; there is a massive stability about it which is expressive of its purpose; but it must be admitted that it does not present anything which is of much architectural interest in itself; it is the old material suitably worked up by a practised hand, that is all. Even so, however, the coherence and balance of the design brings out the more by contrast the singularly piecemeal character of Messrs. Leeming's elevation, which also consists entirely of well-worn details, with the difference that they are not combined or worked up into a whole at all. Consideration of this detail elevation certainly leads to the conclusion that the amateur element in the Committee of Selection must have been in the ascendant when this design was chosen. In fact, the other two elevations have style; this has no style. To remodel it to the extent that would be desirable would be nearly equivalent to making an entirely new study of the design in detail. If this were done, as surely it must be, may we suggest among other improvements the removal of the irrepressible flower-pot from the top of the balustrade? It is really melancholy to think that at this time of day it should be proposed to repeat such a piece of senseless and worn-out *rococo* as this, as part of the design of the most important national building of the day.

GLAZED HALL AND STAIRCASE, ADMIRALTY.

BY MESSRS. ASTON WEBB AND E. INGRESS BELL.

In speaking of the design by Messrs. Webb & Bell generally the other day, we adverted to the fine points in the interior plan which would have been formed by the large glazed and arcaded courts which were to contain the principal staircases, and also to act as *salles des pas perdus* to the several departments, thus making a point of manifest convenience, in the laying out of an elaborate plan, subservient also to architectural effect, as the central features in the arrangement of a plan ought to be. The view of one of these halls, which formed the most noteworthy feature among the fine set of drawings sent in for the second competition by Messrs. Webb & Bell, is here reproduced by the ink-photo process, which gives a certain amount of surface tone and texture to what in its original form was a plain line-drawing, without losing the original lines. This hall was the one which would have formed the principal entrance to the Admiralty Department from the Spring-gardens end of the site. Its connexion with the past and present of the Admiralty Department is sufficiently typified in the drawing, by the statues of former distinguished admirals in chronological succession, and the figures of the departmental clerk or private secretary and the obviously maritime official with whom he is holding converse in the foreground; not to mention the seahorses at the foot of the balustrade, and the anchors worked into the pierced panelling above. These specialised details, however, are very minor considerations in an admirable piece of architectural design, which has the merit of being elegant and graceful without weakness. There is, indeed, a remarkable degree of solidity of effect in the piers of the two lower stories, in comparison with the actual mass of the material employed. It is perhaps rather to be regretted that the old conventionalism of breaking the cornice lines over the pilasters and columns has been so much employed; that may be considered the one weakness of the design, and has the disadvantage of producing too marked a vertical division in the upper stages. Of course, when one objects on strict theoretical principle to these conventionalisms of Classic architecture, one may be met by the question, "What would you do instead?"—a question not always easy to answer. Other forms of language besides that of architecture are full of convenient conventionalisms, and life is too short to allow us to do more sometimes than take them as we find them, as part of the current and accepted mode of expression.

Taken on the whole, however, it may be said that this hall, for the design and drawing of which we believe Mr. Aston Webb is specially responsible, is the best piece of architectural work which the competition has elicited.

STATUE OF THE LATE LORD FREDERICK CAVENDISH.

The bronze statue which is about to be erected at Barrow-in-Furness in memory of the late Lord Frederick Cavendish, was, it will be remembered, exhibited (in plaster) in this year's show at the Royal Academy. Our view of the statue is from a photograph of the work as finished in bronze, without any deviation from the cast as exhibited. It was cast in bronze at the foundry of Mr. James Moore, of Thames Ditton. It is of colossal size, being 10 ft. 6 in. high, and is intended to stand on a pedestal of polished Aberdeen granite 14 ft. high, supplied by Messrs. Alexander Macdonald & Co., of Aberdeen. The site selected is in front of the Town-hall at Barrow, and it is expected that the work will be unveiled in about a month hence. In the opinion of those who were most intimate with the deceased, the sculptor has been very successful in his work. The figure is draped in a long Inverness cape, which Lord Frederick was in the habit of wearing.

PARISH CHURCH OF ST. LEONARD, MIDDLETON, LANCASHIRE.

The church lies about seven miles out of Manchester. It was rebuilt in 1412 by Thomas Langley, Cardinal Bishop of Durham. He obtained permission from John (Bourghill), Bishop of Lichfield and Coventry, to visit and consecrate the church. The date of consecration is August 2nd, 1412. Before this time it had been allowed to fall into decay. Parts of the church are built out of fragments of the old church.

In 1524 the south aisle was reconstructed by the Assheton family. The inscription on this aisle (over the window next to the porch) runs thus:—"Richardus Assheton et Anna Uxor ejus Anno D'ne' MDXXIIII." The Assheton arms are carved in the panels of the chancel screen and other places.

There is a large public-house near the church, built half-timbered, called the Old Boar's Head. A boar's head is conspicuous in the arms. It is conjectured that there was a church here in Saxon times. There is a record of a valuation taken by order of Pope Nicholas IV., 1291.

There are fragments of diaper-work, &c., which seem to date much earlier,—1091. The arch in the baptistery seems to have been the chancel of a Norman church altered at the transition.

The drawing is by Mr. Leeson, of Werneth, near Oldham, who has also made an excellent set of measured drawings of interior details, which we will give in another number.

NEW ENGLISH CHURCH, HYÈRES.

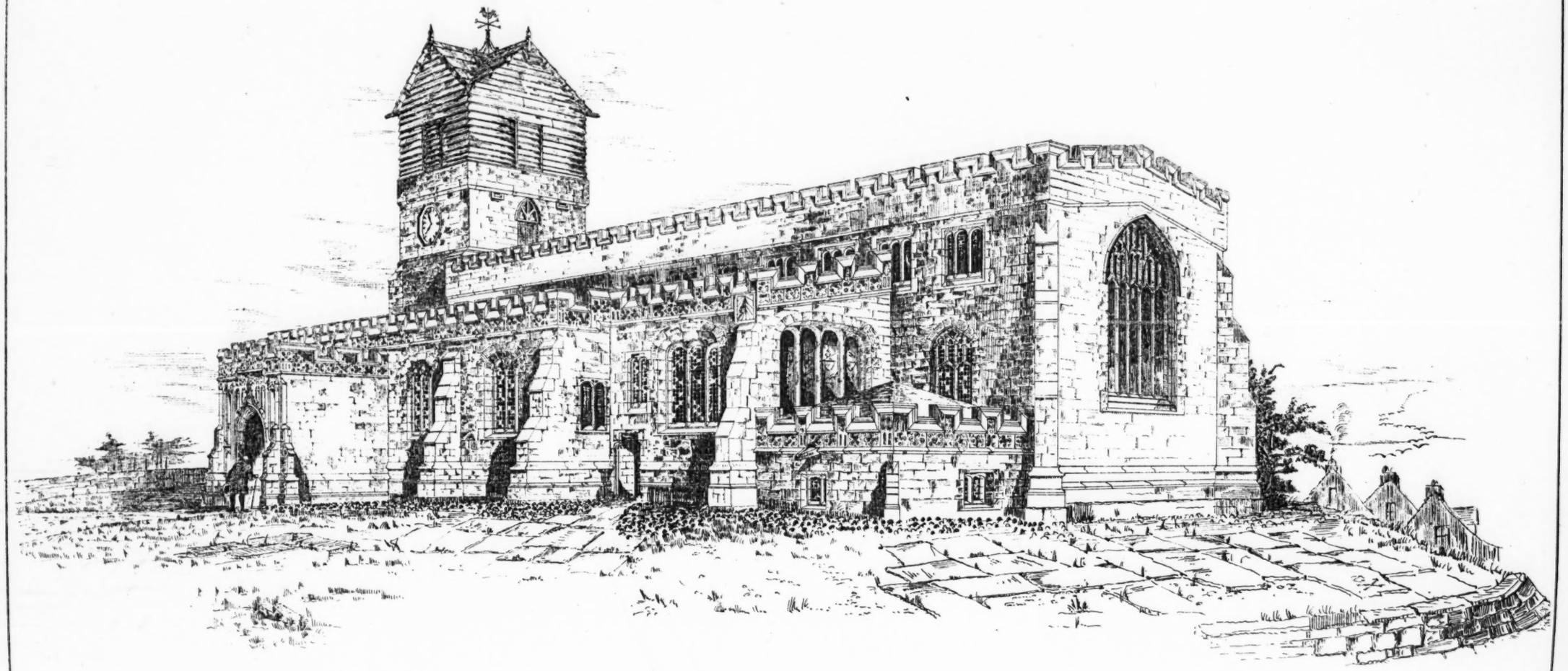
The Church of St. Paul, Hyères, France, was consecrated on Wednesday, February 6th, by the Lord Bishop of Gibraltar, Bishop Courteny taking part, and a large number of clergy being present, both from the Riviera and from England.

The church consists of nave and aisles, with organ-chamber and invalids' chapel, gabled as transepts. It is in the Decorated style of the thirteenth, or early part of the fourteenth, century, and is built of walling-stone obtained from a neighbouring quarry, and freestone of fine and durable quality from near Toulon. The roofs are boarded with moulded ribs, both longitudinally and transversely, having carved bosses at intersections, and all in pitch-pine. The chancel-stalls are wainscot-oak. There is no plastering, the walls being worked inside and outside as random rubble, and pointed in black mortar. The windows are in three-tint quarry cathedral glass, by Brewster, of London, and the east window of richly stained glass, manufactured by Messrs. Jones & Willis, of London, who also supplied the whole of the chairs, stalls, and fittings, and executed the rather elaborate carving. The floor encaustic tiles are by Mr. Collier, of London. There is a bell-cot, and (by especial and rather exclusive permission of the authorities) a bell by Messrs. Warner. The church will seat 450 persons, and a special characteristic is that the invalids' chapel is arranged for Bath chairs, an easy sloping way having been formed, and screens are to be fixed in each of the arches dividing the chapel from the chancel and church respectively. There are crypts for library and waiting-room and clergy vestry. The church is heated by Musgrave, of London, with hot air, and especial care has been exercised in ventilation.

The cost has been 4,500*l.*, two-thirds of which, with the site, was given by a munificent French gentleman, named Godilliot, residing at Hyères, to whom the thanks of the Prince of Wales were conveyed upon the opening day by the Rev. D. L. McAnally, the secretary of the Colonial and Continental Church Society, who have liberally supplied the remainder of the needful funds.

The contractors were Messrs. Bousquet & Son, of Marseilles, the very indefatigable clerk of works being Mr. Gilling, an Englishman, but thoroughly acquainted with foreign languages and works; and the architects are Messrs. G. Habershon & Fawckner, of London.

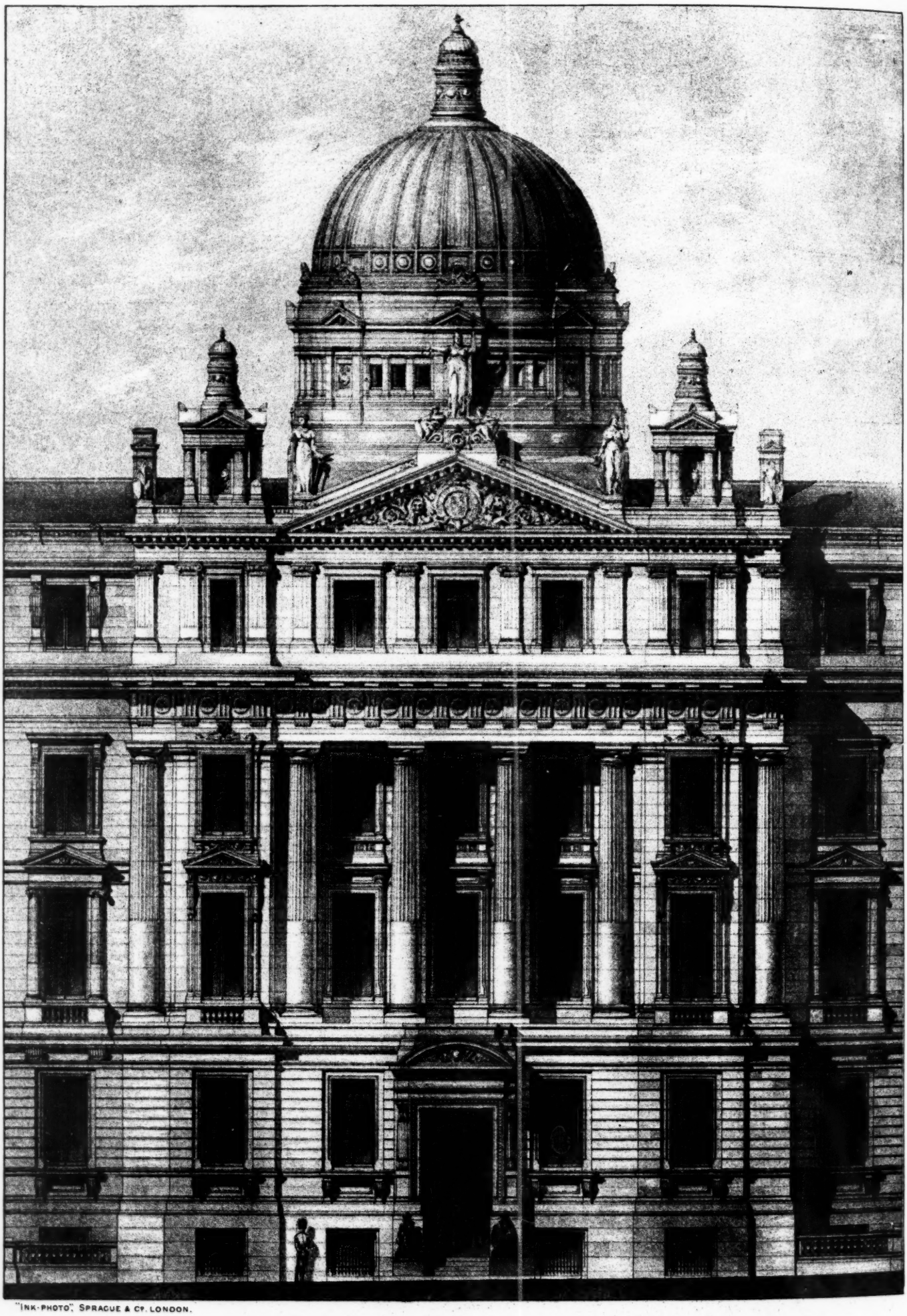
Dangers of Staircase Wells in Artisans' Dwellings.—Another child has been killed by falling down an imperfectly-protected staircase well in one of the large blocks of artisans' dwellings in flats in South London. Children abound in these blocks of buildings, and efficient means should be taken to render such "accidents" impossible.



Wyman & Sons, Photo-Litho. CtQueen St London, WC

CHURCH OF ST. LEONARD, MIDDLETON, LANCASHIRE.

Drawn by Mr. E. W. Leeson.

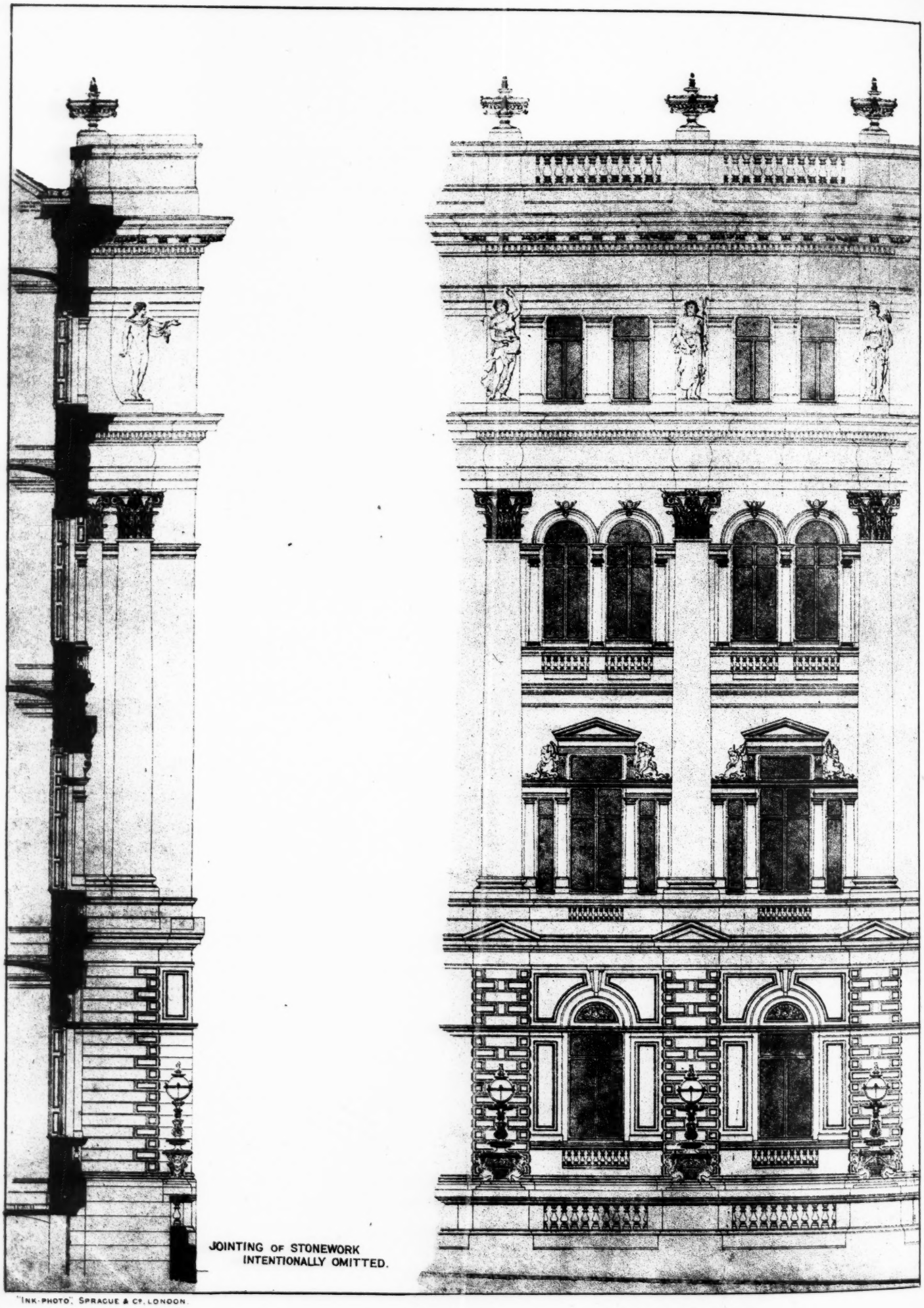


"INK-PHOTO", SPRAGUE & Cº. LONDON.

DESIGN FOR WAR AND ADMIRALTY OFFICES,

BY MESSRS. VERITY & HUNT.

DETAIL ELEVATION.

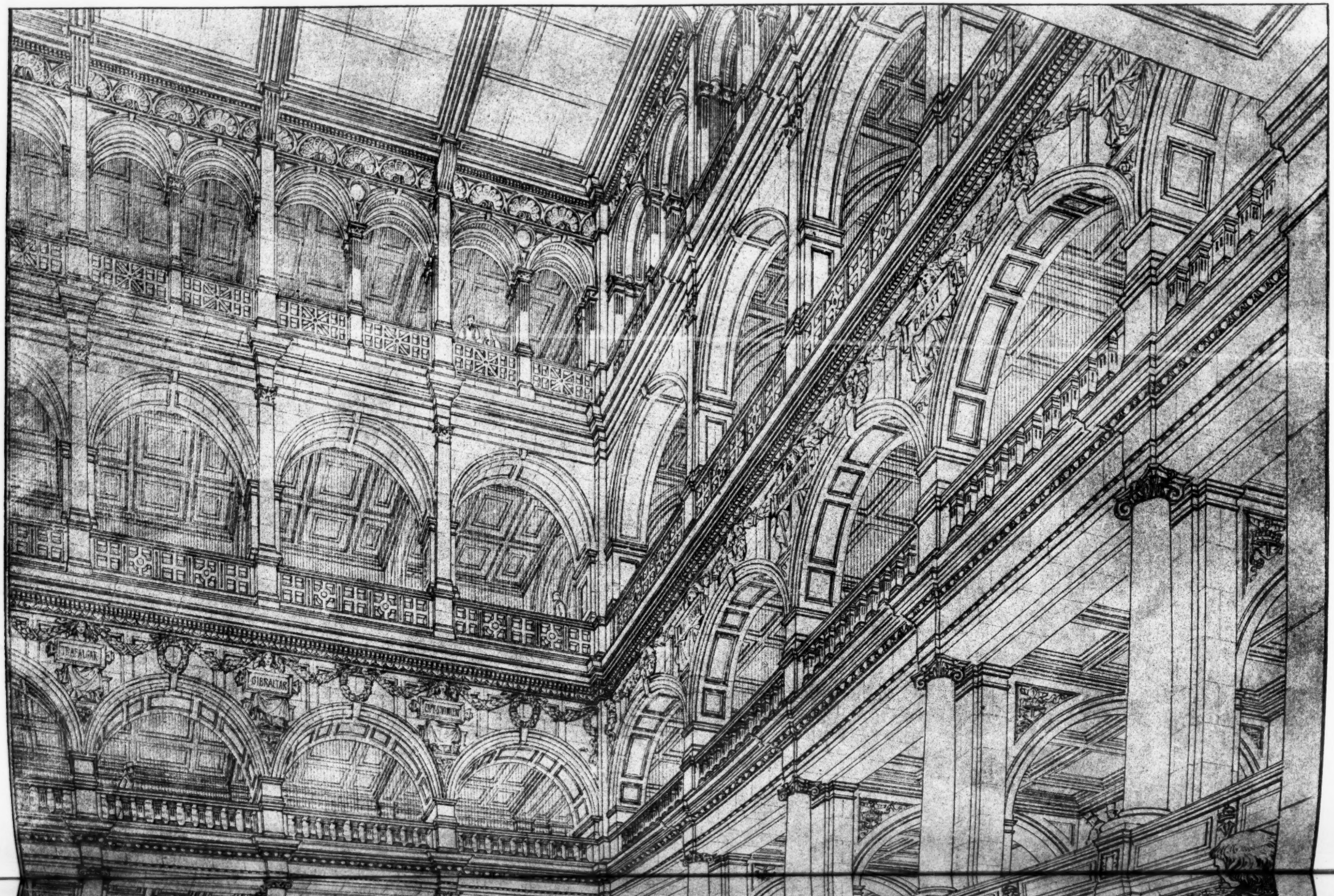


"INK-PHOTO." SPRAGUE & Cº. LONDON.

DESIGN FOR WAR AND ADMIRALTY OFFICES,

By Messrs. Leeming & Leeming.

Detail Elevation.

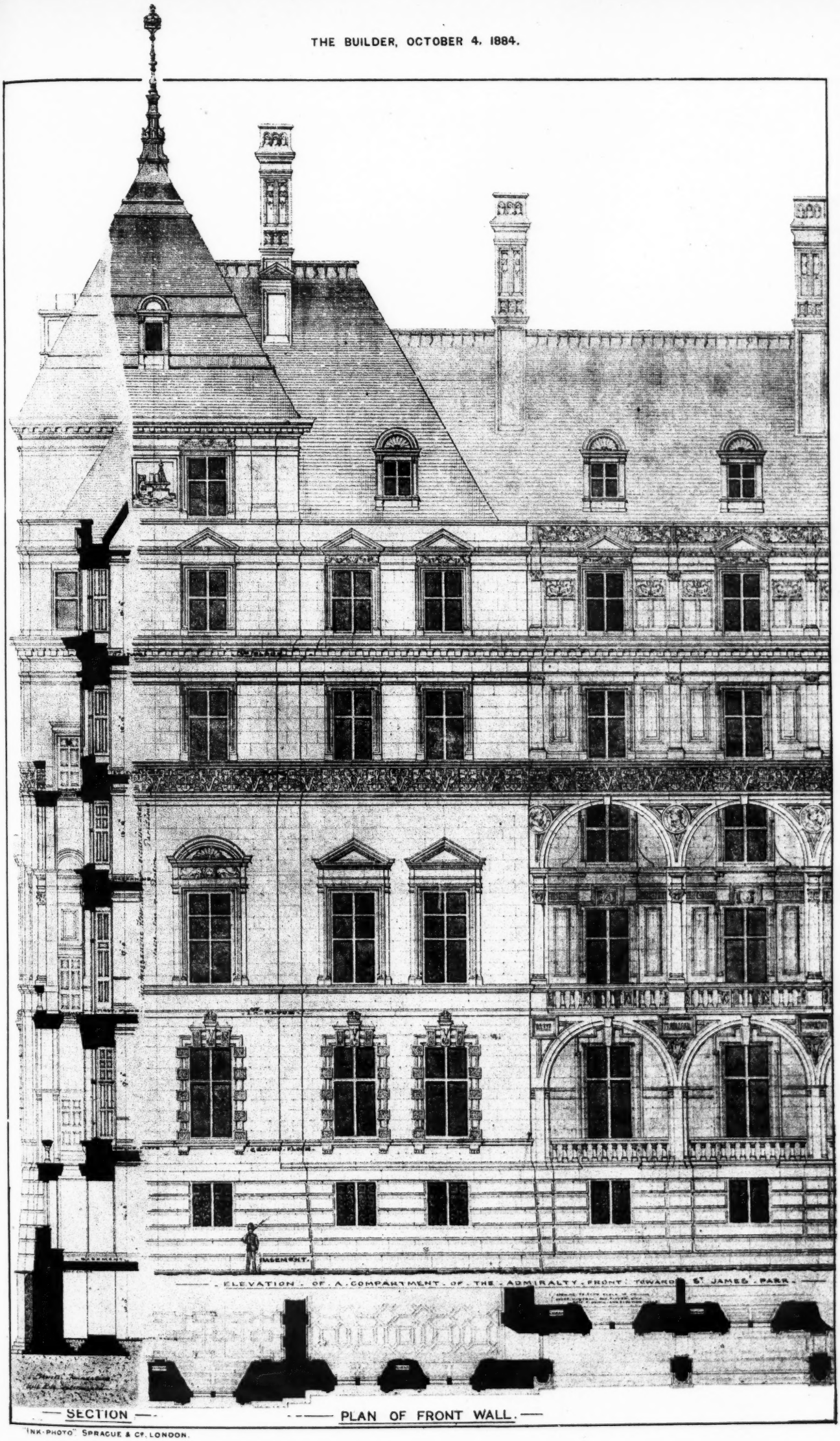

TRAFALGAR
GIBRALTAR

INK-PHOTO, SPRAGUE & Cº, LONDON.

DESIGN FOR WAR AND ADMIRALTY OFFICES,

By Messrs. Aston Webb & E. Ingress Bell.

Glazed Court and Staircase, Admiralty Department.


BASEMENT.
GROUND FLOOR.
ELEVATION OF A COMPARTMENT OF THE ADMIRALTY FRONT TOWARDS ST JAMES' PARK.
SECTION
PLAN OF FRONT WALL.

"INK-PHOTO" SPRAGUE & Cº. LONDON.

DESIGN FOR WAR AND ADMIRALTY OFFICES,

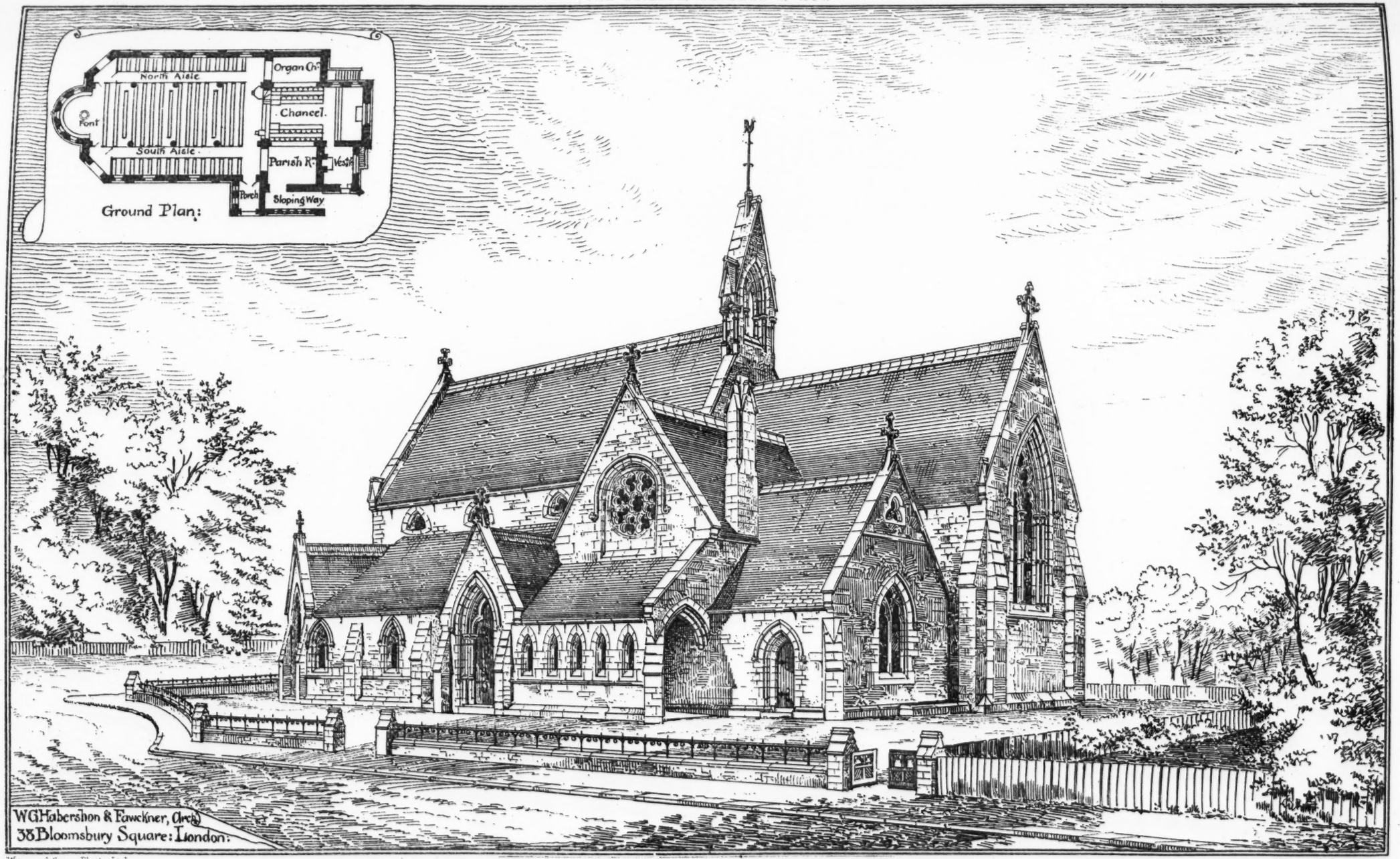
By Messrs. Aston Webb & E. Ingress Bell.

Detail Elevation.

"INK-PHOTO", SPRAGUE & Cº, LONDON

MEMORIAL STATUE OF THE LATE LORD FREDERICK CAVENDISH.

Mr. A. Bruce Joy, Sculptor.



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PROTESTANT CHURCH AT HYÈRES.

THE SOCIAL SCIENCE CONGRESS.

ART DEPARTMENT.

In the course of the discussion which ensued upon the reading of the papers mentioned in our last (p. 419, *ante*),

Mr. T. C. Horsfall (Manchester) said he did not believe that the mere formation of the society suggested by Mr. Besant would be sufficient. Mr. Besant, he gathered, only contemplated the influencing of adults, but it would be necessary even more to get hold of the children. They must not rest contented till they had carried their system into every elementary school in the kingdom. It was necessary that they should keep in mind two principles, if any good or healthy knowledge of art was to be engendered, — in the first place they must teach the people to recognise the superiority of beauty, and in the next they must also have some means of calling their attention to it. They could not possibly attain these without introducing art into the schools. He believed the South Kensington authorities would do much more good if they lent to the local authorities specimens which appealed to the people's knowledge rather than the specimens which they now sent, and he moved a resolution to that effect.

Mr. P. H. Rathbone seconded the motion. They must appeal first of all to the scholars in the Board Schools, and they could only do that by receiving different specimens from South Kensington to those which were usually now sent. They must have specimens which appealed to the knowledge of the people to whom they were sent. He had been very much interested in what Mr. Tuckwell had said about the large number of new makes of artistic pottery, and he himself had been very much struck by the fact that, in pottery especially, they were witnessing efforts on the part of the manufacturers to excel each other in the artistic character of their work.

Mr. Osler (hon. local secretary) deprecated the passage of Mr. Horsfall's resolution, which, he said, was tantamount to asking the Department to go into competition with the shops, and would lead to a great deal of jobbery.

Mr. F. Willson insisted on the necessity of an education in colour for the young as a primary necessity for an appreciation of a love for art.

Mr. E. R. Taylor explained the principles on which the selections were made by the Science and Art Department for the loan collections in the provinces.

Mr. W. H. Wills, M.P., said he thought that Mr. Horsfall's proposition had been somewhat misunderstood by Mr. Osler, and was of opinion that South Kensington might be made to supply what he termed the missing link. Unless the artisan, or the child in the Board school, was taught to distinguish between what was radically wrong and what was intrinsically good, he did not see how they could make much progress. They must teach the A B C of any language before they could expect any one to progress with its literature. He was afraid, however, from his experience of South Kensington, that unless they found volunteers to explain the objects sent, they would not be of much use. He thought much more might be done by those who, like himself, were large employers of labour, if they provided in the buildings set apart for the refreshment of their workpeople some artistic decoration.

Dr. Heinemann spoke in terms of eulogy of the papers which had been read, and maintained that we must go to the elementary schools if we wished to change the artistic character of the people.

Mr. Mark H. Judge, hon. secretary of the Sunday Society, after an ineffectual attempt to move a resolution asking the Council to seek information from the towns where the museums and art galleries were opened on Sunday,—the Chairman having ruled it out of order,—urged that it was only by opening the museums on the only day of the week when they were available for the great bulk of the working classes that they could bring home to the masses a true appreciation of art.

Mr. Besant, in reply, pointed to what had been done in a single generation by South Kensington as evidence of what might yet be accomplished among the lower classes. He would have his proposed college as elastic as possible, both in regard to its curriculum and its management.

ECONOMY AND TRADE DEPARTMENT.

At one of the meetings of this section, Viscount Lymington, M.P., presided over the discussion of the special question, "Would it be advantageous to give to leaseholders powers entitling them to the purchase of the fee simple of the lands and premises they occupy, or otherwise to interfere by law with the prevailing system of building and other long leases?"

Mr. John T. Emmett read a paper on the subject, and gave a description of the method of procedure in the manufacture of leaseholds. He observed that the legal costs are heavy, and are needful only because the system is cumbersome; that as a contrivance for inducing wretched building work and miserable houses for the population no more clever and efficient system could have been invented; that leasehold houses are inconvenient and the building is bad; and that this bad system is, in the metropolis and other districts, rapidly extending. The system was then shown to be enormously disadvantageous to the leasing freeholder, whose property is taken by the lessee at an abatement, owing to the nuisance of the tenure, of some 25 per cent. below the freehold value of the land. The reversion to the freeholder, at the end of the lease, of the lessee's property in buildings is only worth one-eighteenth part of the 25 per cent. and compound interest lost by the effect of the lease, which 25 per cent., moreover, had it been continuously employed in trade for ninety-nine years, would have amounted to about twelve hundred times as much as the reversion. Leasehold tenure is not the only cause of evil to house property, but it is a most malignant evil; and near London, and in many leasehold towns, the inferiority of leasehold houses to the corresponding work in freehold districts is remarkable. Enfranchisement would be gradual in its operation, and in due time universal, thus improving the condition and morals of the entire population.

Mr. J. S. Rubenstein submitted a second paper on the same subject, which was read by the hon. secretary. The writer started by asserting that there can be no dispute as to the evils of the present system of leasehold tenure. The opinion of the late Master of the Rolls, Sir George Jessel, was quoted to the effect that if lessors were to enforce their rights to the full extent allowed them by law, leases would not exist in this country for six months. The lessee, it was pointed out, is not a free agent in the matter of taking or refusing a lease, as in our large towns it is almost an impossibility to obtain a house fit for the lessee's purpose otherwise than on lease. The hardship to the lessee of being subject to unreasonable and antiquated covenants, and the injustice of sinking his capital in another man's soil in making any alterations or improvements, were dwelt upon. These troubles were, it was suggested, intensified where the lease is granted for lives and not for years, and the pernicious and immoral effects of this system were enlarged upon. Stress was laid upon the fact that the evils of leasehold tenure were not confined to the individual tenant, but that the community was interested in repressing the jerry building, the scamped work, and the sordid uniformity that disfigured the suburban districts, and attention was directed to the fact that neglect on the part of anyone of sanitary precautions may injuriously affect the health of others, however observant of hygienic requirements. The provisions of the two Bills introduced into Parliament by Mr. Broadhurst and Lord Randolph Churchill were briefly referred to. It was, however, suggested that there was one class of persons, the occupiers, whose interest deserved legislative consideration. The occupier was, for the time being, largely interested in the house, and the writer would confer on a *bonâ-fide* occupant, a person who had been in continuous occupation for, say five years, the right to acquire all superior interests. A special tribunal, after the model of the Court created by the Irish Land Act, was advocated as the best form of tribunal for assessing values.

Professor Leone Levi, in opening the discussion, said he desired that the labouring classes should have a greater interest in property. Let the franchise be extended to them, but give them, at the same time, something to defend. He presumed that the readers of the papers would limit their ideas to municipal areas; therefore they were now speaking of house property within the towns, and not of land in general. The terms would have to be settled by arbitration or by a competent tribunal. It was not a question of confiscation, but of giving fair value, and there would be considerable difficulty in settling the values of certain properties.

Mr. Hurst was inclined to believe that a man who had a ninety-nine years' lease was likely to build as well or even better than he would on his own land.

Mr. Rowlands (hon. secretary to the Leaseholds Enfranchisement Association) believed that no private Bill would carry out what they desired, but it could be done with the aid of the legal officers of the Crown. There seemed to be a tendency to deal with the matter only in its relation to London, but he believed the leasehold system had a much more detrimental effect in some of the provincial towns.

Mr. King Fordham thought that the evils of the present system were very much exaggerated. Those who wished to live in houses of their own would find little difficulty in doing so. It was desirable that there should be two distinct classes, the capitalists who built and the occupiers who inhabited.

Councillor Granger (Birmingham) remarked that the papers had only dealt with the transference of property from one individual to another, forgetting that it was the community at large who made the increased value, and who should have the advantage of the unearned increment. Land ought to be made a marketable commodity; and the proposals of Mr. Broadhurst and Lord Randolph Churchill were a mere tinkering with the question. It was said that a man who built ought to be able to purchase the ownership of the land, but the most difficult part of the question was the standard of value to be fixed. In order to maintain the sanitary position of large towns the generality of dwelling-houses ought to be rebuilt every third generation. There was a great difference between moderately substantial and "jerry" buildings. He admitted the want of a thorough reform of the land laws, but unless it were thoroughly done the land would get into the hands of capitalists, who were worse, as far as workmen were concerned, than the large landholders. The Scotch system of feuing would, if adopted in England, meet all the wants of the community as far as the individual transfer of land was concerned. The Birmingham Improvement Scheme was running on the right lines. The Corporation bought land at its current value, but anticipating that with the progress of the town its value would increase, and giving the community the whole of the increased value.

The Chairman, in summing up, said they were all convinced of the importance of increasing the ownership of land. He had gone so far in that direction as to second on two occasions a proposal introduced by Mr. Jesse Collings, which would have the effect of enabling the State to lend its credit for the purpose of increasing the number of owners. He had opposed Mr. Broadhurst's Bill, not being convinced of its practical benefit. The gist of the matter depended on the unearned increment on land. The great question was to make the law insist that the tenure of land in the large cities should be used for the advantage of the community and not of the individual. Mr. Broadhurst suggested that this would, to a large extent be effected by conferring on every leaseholder the potential right to become a freeholder. In the course of the debate those who supported his views had not answered the financial difficulties embodied in the proposal. It seemed to him that Parliament had a doubtful right to interfere with and override the conditions of a contract originally entered into. The solution of the question seemed to be in the direction of the municipalisation of land, and he could not see why large corporations should not possess compulsory powers to purchase land from individuals on fair terms.

HEALTH DEPARTMENT.

In this department, Mr. J. Hamer, honorary secretary to the Mansion House Council on the Dwellings of the People, contributed a paper upon "What are the best means, legislative or other, of securing those improvements in the dwellings of the poor which are essential to the welfare of the people." Amongst the "other" means for remedying the particular evils, the writer placed in the foremost rank associations of men and women whose object was by personal visitation of and familiar intercourse with the masses to arouse

such feelings of sympathy, hope, and courage as should educate the people themselves to a proper degree of decency. This once done, the rest would follow as a matter of course. As to the legislative or administrative means, the writer said the machinery at present at work in enforcing the laws of sanitation was terribly deficient. When this was not the case, the means at command were utterly incompetent to overtake the work which ought to be done. For instance, in London every sanitary official had to look after the health of 26,000 persons. It was manifest that the Sanitary Acts were incompetent to perform the work. Public improvements, in themselves admirable, entailed the sweeping away of streets and houses, out of which the people were turned before provision had been made for housing them; 22,000 persons had been compelled to leave their unsanitary homes in London under the powers of the Industrial Dwellings Acts, but accommodation had been provided for only 14,000. It seemed absurd, but, nevertheless, it was a fact, that the sanitary authorities existed rather for the removal of nuisances than for the prevention of disease. They wanted a large remedy for these large evils. No tinkering measure of reform would avail, and ample powers should be placed in the hands of a largely-increased official staff, responsible not to property-owners, but to a higher authority; in short, to a special department of the State. His proposal was, that they should adapt their official machinery to their altered circumstances, and create a Ministry of Health and Education. Nothing short of a practical measure of this comprehensive character would, in his opinion, meet the case. He was not in favour of centralisation as such. He had the greatest faith in healthy local government, where practicable; but he maintained that the health and the education of the people were so vital that their regulation should be a national, or, in other words, a State, affair.

The discussion upon the paper was opened by Dr. Foster (Edgbaston), who advocated the cleansing of the houses in the worst parts of towns by the authorities, so placing a good example before the people, which, he believed, they would after a time endeavour to follow. He believed that the whole legislation with regard to health in this country had been wrong; it was made a subsidiary question. It was desirable that in the future every building should have a certificate that it was fit for habitation, before any person was allowed to enter it.

The Right Hon. G. Shaw-Lefevre, M.P., said the case of London was different from that of every other town, and far more difficult to cope with. He pointed out the laws available for dealing with the question, observing that Torrens's Act was for dealing with individual cases, and Sir R. Cross's Act for dealing with large numbers of houses. He did not think it was possible to improve the Torrens Act for its purpose, but he had made an improvement on Cross's Act in 1882, providing that the municipal authorities should only be compelled to build upon half the area cleared for dwellings for the poor turned out. That greatly reduced the expenses of the work, which before was so enormous as to prevent the Acts being put into force. He thought they might even go further, for it was found that many of the persons living in the poorer parts of London went several miles to their work in the suburbs, and the local authority might have power to choose a cheaper site near their work, and so be able to realise the full value of the cleared site. The method of compensation, too, was capable of improvement, in such a way that the sum to be paid would be considerably less. Cross's Act provided that the owners should only receive one-half compensation, but still the cost was enormous. He was greatly averse to the local authorities building houses for the poor. The state of things was due to the law, and not to the neglect of the local authorities. In carrying on such works the Government might advance money at lower rates of interest.

Professor Gairdner (Glasgow) said the experiment tried at Glasgow had been a success, for there, the people displaced had been improved by the displacement. He did not know of any principle upon which the local authorities would become landlords to the poor, and compete with private enterprise. The principle upon which such things ought to be done was the upholding of the good and the condemnation of the bad rigidly carried out, so that if a man built a house, he would be certain that if it were bad it would be condemned, and have to come down. By such means they might effect the desired changes.

Mr. F. S. Powell said that a low sanitary condition was indelibly connected with a state of pauperism. He deprecated State interference on the ground that it would affect rents, and that again would affect wages, which was a thing to be avoided. There were, however, laws which might be made, and which, if carried out, would effect the changes required.

Mr. Solly believed the "bitter cry" of London was answered by the cry of the country, which was half depopulated by the people flocking to the towns, and was never so badly cultivated as during the past few years.

Mr. W. Storr, London, was of opinion that the key to the question rested in teaching the people, and calling upon them to see that they lived under proper conditions. It was not good that Sanitary Aid Committees should permanently exist, and assume such a position towards the authorities as was done by the committee in London.

Miss A. Bewick, London, suggested that the manufacturers should take their works to the country, when the workmen would follow them, and so get good air, and cure the overcrowding of towns.

Mr. Mark Judge, London, was of opinion that State interference in these matters had already gone too far; and that the matter rested with the individuals most concerned.

Mr. H. H. Collins, London, thought that when people began to feel that they were concerned in their own cleanliness and health, the existing state of things would be altered.

Another question dealt with in the Health Department was, "How far may the average death-rate of a population be considered an efficient test of its sanitary condition; and by what means can the high death-rate of children be reduced?"

Mr. Noel A. Humphreys, of the General Register Office, Somerset House, contributed the first paper on the subject. He urged the public need for some numerical test of sanitary condition, and considered that the increasing use of the death-rate for this purpose was referable in a large degree to the growth of public interest in health matters which had been the mainspring of recent sanitary progress. In view of his appeal and of the good that had already resulted from the use of the death-rate for this purpose, he pointed out the inexpediency of its surrender except in cases where its use had proved to be absolutely mischievous, or unless some better numerical test could be provided in its place. The detractors of death-rates consisted in part of those who were only partially acquainted with the true and extreme effect of various disturbing influences on death-rates; whilst others objected to them as tests of sanitary condition, because, in the interest of sanitary authorities, they gave a limited signification to the term "sanitary condition." Death-rates were, in the main, trustworthy numerical tests of "health condition," although they might not be of sanitary condition so limited. After referring to the various influences tending to disturb the value of the death-rate as a test of sanitary condition, and which had been urged as fatal objections against its utilisation for such a purpose, the writer went on to say that as death-rates might at all times be compared with the death-rate in healthy districts, 17 per 1,000, most of the objections made to this comparison were thus obviated. As the result of his investigations, he considered that death-rates afforded a numerical test of health condition, sufficiently approximate and trustworthy to be useful in the future as they had been in the past, as a stimulant of the public interest in health progress.

Dr. Ashby, physician at Pendlebury Hospital for Sick Children, followed with a paper on the same subject, with special reference to the means by which the high death-rate of children could be reduced. He quoted statistics to show that among the working classes of large manufacturing towns the number of deaths among infants under one year equalled one-third, and under five years was equal to one-half of the total deaths at all ages. The causes of this high mortality were very complex, and included the influence of the health and life conditions of the parents in producing weakly children, insanitary conditions of dwellings, improper feeding of young infants, poverty, degradation, and drunkenness of parents. The means which he suggested whereby this high infant mortality might be reduced were an improvement in the surroundings and homes of the working classes; the provision of open spaces; the diminution of smoke; improved dwellings; checks on burial clubs and friendly societies; an improvement in the habits and status of the working classes by means of education; and the extension of ladies' sanitary associations for systematic work among the poor.

In the course of the discussion which followed,

Mr. Baldwin Latham said the causes given in the papers would not wholly account for the infant mortality. His belief, after many years' observations, was that the amount of underground water seriously affected the death-rate of infants. His observations had shown that there was the largest mortality where there was the smallest rate, and *vice versâ*. Perhaps the reason of that was that the greater the rainfall the greater the amount of the organic matter in the ground which was oxydised and the impurities taken away.

Professor Gairdner (Glasgow) paid a tribute to the memory of Dr. Farr, the introducer of death statistics, and said that the result of his own observations was that he had come to the conclusion that the best test of the sanitary condition of a place was the mortality among lives of under one year of age. He was also of opinion that many of the infant deaths were due to the fact that in many agricultural places the families were undomesticated by the mother going to work, the infant being left in charge of some other person. It was frightful, too, that in large towns where great improvements were being made, it was still possible for houses to be built in which children had no other playground than the gutter, and no place where they could get the air and exercise necessary for a growing child.

Mr. Neison (London) did not think the average death-rate was any criterion of the sanitary condition of a place, and he suggested that five groups of ages should be taken, and the mean of those rates would give an adjustment of the varying mortalities. He was of opinion that the sick-rate did not bear a proportion to the death-rate, and would like to see a national registration of sickness.

The Chairman (Dr. Norman Chevers) attributed much of infant mortality to ignorance on the part of the mother. This might be greatly reduced by the efforts of benevolent ladies who could give those poor parents a hint as to the management of their children.

Mr. Humphreys, in replying, said it was possible that they might get a better test of the sanitary condition of a place, but until they could get a better, the average death-rate was the best they had, and it had been very useful indeed. All the Sanitary Acts of late years were traceable to that rate, and the consequence of those Acts was that the rate had wonderfully decreased.

Dr. Ashby also briefly replied.

PROPOSED PLUMBERS' CONFERENCE.

A MEETING of plumbers and of persons interested in the work of the plumbing trade was held on Friday, the 26th ult.,* in the Mayor's Court, Guildhall. The chair was occupied by Mr. George Shaw, Master of the Plumbers' Company.

Mr. J. D. Towse, clerk to the Plumbers' Company, read the following invitation, of which about sixty copies had been sent out:—

"You are respectfully invited to attend a meeting of gentlemen interested in the art and trade of plumbing, to take into consideration the desirability of action being taken by which the status of the trade may be advanced, and the interest of the public protected, from evil arising from bad work and bad workmen."

The Chairman said they were met as members of the public as well as plumbers, desiring protection for themselves and their families against the evils of bad plumbing. The foundation of the Plumbers' Company rested on a solid and sound basis. An ordinance of Edward III. stated that no one should meddle with works touching such trade except by consent of the best and most skilled men in the City testifying that he could well and completely do

* We were not responsible for the mistakes in the paragraph inserted last week (p. 444), which was sent to us by a gentleman whom we understood to be one of the conveners of the meeting, and who recalled the paragraph, but too late. That paragraph made it appear that the Conference was held at the Health Exhibition, and gave in advance a list of the subjects discussed.

his work. Any action that might now be taken in this matter would, therefore, be a revival of this enactment as far as was consistent with the spirit of the times. The object of the proposed Conference would be to give practical expression to the desirability of such an ordinance. The Plumbers' Company numbered amongst its members men who, like himself, had worked in every branch of the trade, and who had acquired their experience as man and master. In addition, there were professional members, and persons whose social position enabled them to support the credit of the body, and to advance its usefulness. It was, therefore, now prepared, as in previous times in its long history, to perform its proper and legitimate functions for the protection of the public, as well as of those who honestly followed the trade and craft of plumbing. The Court of the Plumbers' Company had given careful consideration to the various applications made to them on the subject of the proposed Conference, and it was his pleasure, as Master of the Company, to announce their willingness to give the fullest aid in advancing it. He took it that the object of this meeting was chiefly to consider two or three points,—first, the subjects to be treated; secondly, the date at which the conference should be held; thirdly, the place of meeting; and lastly, the arrangements of which all this would be carried out. He would suggest the appointment, in the first place, of a general committee, and the selection of a smaller body as the executive, who, having time to spare, will give their attention to the various points to be dealt with. As he had already mentioned, he had a practical knowledge of every branch of the craft, and any action which might be taken by which its status was raised would have his hearty support. The Plumbers' Company also desired to further any such result.

Mr. Davies (London) proposed:—

"That the Plumbers' Company be now requested to communicate with the National Health Society, the Sanitary Institute, and others, to arrange for a Conference of Metropolitan and Provincial Plumbers."

It was high time, he remarked, that steps should be taken to rectify the scandalous way in which the trade was being carried on generally. What they wanted was to form themselves into a body so as to establish a set of rules which would be beneficial to the public and the trade. The only way of doing that would be to come into close contact with the City guilds, by whose aid and that of the Sanitary Institute, such a set of rules might be established. When these were formulated there would be no difficulty in petitioning Parliament to make them law, in a somewhat similar manner to what had been done in America.

A Voice.—The Act of Edward has never been repealed.

Mr. Davies observed, in continuation, that the Act of Edward was practically obsolete. They ought also to endeavour to get the assistance of the different London vestries, who should send a qualified inspector to examine the plans before the work was done. The matter of apprenticeship would be an important question for the Conference to deal with. The promoters of the Conference wished to have the co-operation of architects and builders, for without their assistance things would remain in the same condition as at present.

Mr. Robert Smith seconded the resolution.

Mr. John Smeaton (London) considered that the law of Edward III. was the very thing they required to be put in force at present,—what they wished was to be protected. No man should be allowed to call himself a plumber unless he had served a proper apprenticeship, and he should be able to do hot-water fitting and gasfitting. The great thing for them to do was to get the support of the Plumbers' Company and of the architects. A great many provincial men, he believed, would have been present if they had been invited. The country plumbers should be duly represented upon any committee that might be elected.

The resolution was then put and carried unanimously.

Mr. Balster (Margate) next proposed:—

"That the Plumbers' Company be requested to communicate with the Executive Council of the Health Exhibition, South Kensington, with the view of a Conference being held at the Exhibition Buildings previously to the Exhibition being closed."

Mr. Stapley (Upton) seconded the resolution, which was carried.

Mr. Smeaton moved:—

"That a syllabus of the subjects discussed at this meeting be discussed at the Conference." *

This was seconded by Mr. Robert Smith, and agreed to.

Some other resolutions were passed, and it was further decided that a general committee of fifteen, and an executive committee of five, should be formed. The following gentlemen were appointed as a general committee, viz.:—Messrs. W. P. Buchan (Glasgow), John Smeaton, Daniel Emptage, Robert Smith, Hudson, George Shaw, Davies, Hellyer, Coles, W. Webb, Court, H. Lobb, Wilkinson (architect), and Ernest Hart. Power was given to the chairman to fill up the vacant places.

In the discussion on these names, Mr. Smeaton thought it would be best to elect representative men connected with the trade, and have no "sanitary quacks."

The Chairman considered that it would be well to have scientific as well as practical men. He believed they had that day laid the foundation of something which would ultimately be of great public utility.

Mr. Towse was invited to become Clerk to the Conference, and a vote of thanks to the Chairman closed the proceedings.

COMPETITIONS.

Lincoln School of Science and Art.—The Building Committee met at the Guildhall last week to receive the report of Mr. Charles Barry, the architect they had consulted on the subject of the plans submitted in competition. From the report we gather that sixty-five sets of designs were sent in. Notwithstanding that nearly all the competitors express their confidence that their designs could be carried out for a sum within 10 per cent. of the stipulated amount, Mr. Barry has found, by having nine of the designs cubed up, that the cubical contents vary very considerably, from 347,348 ft. to 662,641 ft. The designs with the larger cubes naturally in some respects are superior to those with the smaller cubes, so that there was an obvious difficulty in selecting a design which was superior to the rest, having regard to cost, and also as to merit. As it seemed to Mr. Barry, the only course that could fairly and wisely be taken was to deal only with the best of those designs the probable cost of which most nearly approximated to the sum named in the conditions, as those only could be dealt with by the committee with the means at their disposal. Of these he places, as the best in merit,—1, "For Ever;" 2, "Study" (Grey Mount); 3, "Academia." The committee resolved:—"That the plan 'For Ever' having been placed first by Mr. Barry, and also approved by the authorities at South Kensington, the committee, in accordance with the powers given to them by the general meeting of subscribers, on the 29th day of March last, select this plan, and award it the first premium, on condition that it can be carried out within the price limited by the conditions of competition." The envelope bearing the motto "For Ever" was then opened, and the name of the successful competitor was found to be Mr. George Sedger, of Park-villas, Ravenscourt Park, London. As it appeared to the committee that the plans "Study" and "Academia" could not be carried out for any sum approximate to the amount specified in the conditions of competition, it was further resolved that Mr. Barry should be consulted as to whether the second and third prizes should be awarded to these plans or not.

GREENHOUSES AND THE BUILDING ACT.

THE DISTRICT SURVEYOR FOR EAST HACKNEY (NORTH) *v.* KING.

At the Worship-street police court, on the 24th ult., before Mr. Hosack, the district surveyor summoned the defendant for a fee in respect of a detached greenhouse, 16 ft. long, 9 ft. wide, erected in the back garden of 31, Bailey's-lane.

The magistrate said he would allow that a greenhouse attached to a building was not exempt, but thought one which was detached, as in this case, was exempt, and he should dismiss the summons. *

Stoves and Grates at the Health Exhibition.—Owing to pressure on our space this week we are obliged to defer our promised notice of the stoves and grates at the Health Exhibition.

* The list of subjects will be found in the paragraph we published last week.

THE DOME OF ST. PAUL'S.

Sir,—There is no one who would more rejoice than I, to see the two eminent painters who have lent their genius to the carrying-out of Stevens's crude suggestions employed in some important public edifice whereon their great talents would have free scope; there is even ample space for the exercise of their invention and skill in St. Paul's, other than in the region of the dome. Of my friend Mr. J. B. Clayton's judgment I have, in general, the highest opinion, but the decoration of the dome of the cathedral is complicated with several important and somewhat conflicting considerations that leave room for divergence of opinion, between the verges of which I have recently, as well as in years past, sought the middle course.

The question of choice with regard to the decoration of the dome resolves itself into this,—Shall we have an utterly inappropriate arrangement of panelling, framing good art which cannot be well seen, and which, consequently is to a great extent thrown away (Stevens's scheme), or an immeasurably superior general arrangement (Thornhill's), containing inferior art? This, I say, is the choice left to us, in so far as the decorations themselves are concerned. But there is a question,—a very important question,—over and above this, and one of vast moment to all painters and sculptors, now as well as in times to come,—and that is the question of precedent. We have lately been reminded that if Thornhill's work be effaced, it will establish a precedent for future erasures. "Why not," it may be asked, "also sweep away Gibbons's work, and the sculpture on the exterior?—for these are, on principles of taste, not strictly the thing. Did the great Italian masters lend themselves to the effacement of the puerile work of the early painters and sculptors?" We are compelled to admit that they did not. The foregoing remarks are the more pertinent, when we come to reflect that Thornhill has a reputation with respect to the decorations in the dome, and that these very decorations were executed under the eye, and with the sanction, of the great architect, Sir Christepher Wren, himself. I certainly proposed, and still adhere to the proposal, that the figure-subjects in Thornhill's arrangement shall be translated into colour,—first, because both the painter and the architect wished to have had them in colour, their wish being overruled by the prejudices of the age in which they lived; and, secondly, because I am totally opposed to the effacement of the work of a painter, were it much worse than it is, so intimately associated as Thornhill with the early struggles of art in England. The temptation of even some superlatively better arrangement than Thornhill's, if this were possible, would not move me from this stand-point; but when with pleasantry an attempt is made to coerce the acceptance of an ill-devised scheme of decoration,—a scheme upon which, it has been experimentally demonstrated, the best art would be to a great extent thrown away and sacrificed, I feel more than justified in asserting that it is the duty of Englishmen, of the citizens of London, and of artists, to respect the name and the work of Sir James Thornhill.

W. Cave Thomas.

THE SELECTED DESIGN FOR THE NEW WAR OFFICE.

Sir,—Sufficient time having elapsed, since the opening of the exhibition of the nine designs, for careful and deliberate consideration of the one chosen by the judges, I should like to point out what appears to me as a peculiarity in the elevations, the more so as it is less striking on paper than it would be if worked out in the solid. I refer to the two entablatures of equal size in close juxtaposition, with which it is proposed to finish the summit of the building.* The space between them is equal to one of the entablatures. Now, as this beautiful pen-and-ink design is some day to become a more or less substantial reality,—a national edifice, for the cost of which we shall all be taxed,—it appears to me that there should be no hesitation in criticising it. Perhaps its author would be one of the last to object to this, if conducted in a fair spirit. For my own part, I admire the design as a whole, and though there is not much originality about it, it only sins like all the rest in this respect. In one

* The detail of the elevation is given in the present number.—Ed.

quality of architectural design,—dignity,—it is superior to them. The introduction of columns extending through two stories secured this effect, so important in a national building of immense size, while, at the same time, variety in the subdivision of the height of the façade was secured. All things considered, I venture to think that the judges have come to a fair and just decision. At the same time, it must be remembered that there are 119 other designs which the judges alone have seen, but which I venture to assert the public had a *right* to inspect. What I have ventured to object to above is,—though very important,—a matter of detail. It shows, however, such poverty of resource that I feel convinced it will, in some way or other, be altered. The lower entablature must be got rid of. The fenestration is, of course, fixed. The difficulty would appear to me to be solved by slightly reducing the height of the columns and turning arches from them. By this arrangement we should have elegance and variety in place of the proposed rigidity and monotony.

SIGMA.

The Student's Column.

ON THE CONSTRUCTION OF FLOORS.

I.

THE nature of the materials employed in the construction of the floors of a building, as well as the mode in which they are applied, must depend on the character of the building, and the uses to which it is to be put when completed. The surface of the floor may be of wood, stone, cement, or asphalte, while the substructure may be of timber, iron, concrete, or brick.

Wooden floors are those most commonly used in this country, and consist of thin smooth boards, nailed closely together, and laid perfectly level upon a row of timbers placed across from wall to wall, and called *joists*. In carpentry the term "floor" is applied to the timbers only which carry the boarding, to which the term "naked flooring" is sometimes applied, and we shall now consider the modes in which these timbers can be arranged so as to give the greatest amount of firmness to the floor.

Single-joisted floor is the simplest kind of naked flooring that can be employed, and is the one most commonly used for private dwellings and other buildings where the span between the walls is not very great. The joists are narrow beams, 2 in. to 3 in. thick, and varying in depth from 4 in. to 12 in., according to the distance apart of the bearings; these are placed horizontally across from wall to wall without any intermediate supports, and from 10 in. to 12 in. apart, their ends should be made to rest upon flat pieces of timber bedded on the walls and called *wall-plates*, which are generally 4½ in. wide by 3 in. thick; the ends of the joists being spiked to the plates, and resting not less than 4 in. upon them. The ends of the joists should not touch the brickwork or masonry, but a space of about ½ in. should be left between the wood and the walling to allow the circulation of air, and prevent the ends of the joists from rotting. In houses having back and front rooms with a partition between them, the joists should, if possible, be laid in one length from front to back wall, and rest upon a plate on the cross-wall or partition, as their strength and stiffness are greater when they are in one length than when in two lengths. The joists should never be laid wider apart than 12 in. where ordinary floor-boards and ceiling-laths have to be fixed to them; in fact, 12 in. from centre to centre is the most convenient both for floor-boards and ceiling-laths, since the latter are generally 3 ft. in length.

The *scantling* of joists, or the dimensions of breadth and thickness, will depend upon the length of bearing or clear space between the points of support. Allowing 1 cwt. per foot superficial as the utmost weight that an ordinary house-floor will have to sustain, the minimum depth for fir joists 2 in. thick and 12 in. apart from middle to middle, should be as follows:—

Length of Bearing.	Depth.
5 feet.	4 inches.
7 ,,	5 ,,
10 ,,	7 ,,
13 ,,	9 ,,
16 ,,	11 ,,
18 ,,	12 ,,

If the scantling is made less than the above, the vibration produced by persons moving about on the floor will cause cracks to appear in the ceiling below, and will also tend to weaken the walls of the house. When the bearing exceeds 8 ft., it is advisable to stiffen the joists by means of a row of crossed pieces of wood nailed between each pair, called *herring-bone strutting*; of which there should be two rows when the bearing exceeds 12 ft. Before fixing the strutting, a slight camber is sometimes given to the joists by placing a plank underneath them, and forcing up the centre about 1 in.; this plank being removed after the strutting is fixed causes it to tighten so as to render the floor more rigid.

In order to lessen the liability of the ceiling under a single-joisted floor to become cracked, Tredgold suggests that every third or fourth joist be made a little deeper than the rest, and the ceiling joists fixed to the deeper ones, and crossing them at right angles, being notched and spiked to the underside; by this plan the depth is but slightly increased, sounds will not pass so freely as in an ordinary single-joisted floor, and the ceilings will stand better.

The passage of sound through floors is usually prevented to a considerable extent by nailing fillets of wood half-way down the sides of the joists, and laying short pieces of rough board upon them, so as to form a floor on which a coating of rough plaster, called pugging, is laid about 2 in. in thickness.

It is sometimes necessary to leave an opening in the naked floor wider than the space between two joists, in which case one or more joists have to be stopped short of the opening, and their ends are let into a cross piece of timber called a *trimmer*, which itself has the ends let into the two joists which form two sides of the opening. A plan of this arrangement is shown on fig. 1, where *a a* are the trimmers; *b b* the

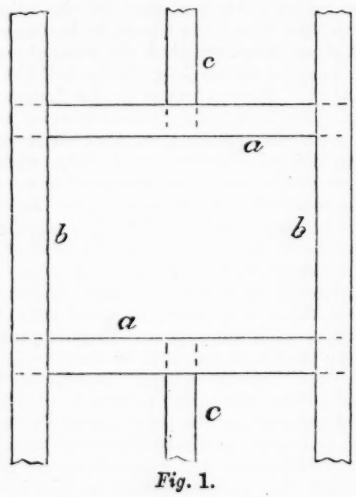

Fig. 1.

trimmer joists, to which the trimmers are fixed by means of tenons cut on their ends, and let into mortises in the middle of the joists; the joists, *c c*, are cut off to allow for the opening and their ends tenoned into the trimmers. The trimmers and trimmer-joists should be rather thicker than the other joists, to allow for the additional strain upon them, and the reduction of strength by cutting away for mortises. In the case of a chimney opening, the trimmers have one end resting on the wall at the side of the chimney-breast, and a fillet of wood is nailed at the side of the trimmer-joist to support one side of a brick trimmer-arch, which is thrown across to the chimney-breast for the purpose of carrying the stone hearth. According to Tredgold, it will be sufficient to add ⅛ in. to the thickness of a trimming-joist for each joist supported bp the trimmer.

The mode of constructing the lowest floor of a building where the floor is raised only a foot or two above the ground, differs somewhat from that of the upper floors, advantage being taken of the nearness of the ground to make it act as a direct support to the timbers. Brick piers or walls are built about 5 ft. apart across the building, and on these are laid horizontal pieces of timber called *sleepers*, generally about 4 in. by 3 in.; the floor-joists are laid across the sleepers and spiked to them; the bearing being short we are enabled to use joists of light scantling, about 4 in. by 2 in. being sufficient for ordinary floors. In this kind of floor no trimming is required round the fireplace, *fender* walls being built to support the hearth, and also to receive the ends of the joists. Air gratings should always be introduced in the outer walls below the level of the ground-floor to allow a free circulation of air, so as to prevent the timbers from being affected by dry-rot. A coating of concrete and asphalte, or else a layer of smith's ashes should be laid on the surface of the earth to prevent damp and noxious exhalations from rising to the floor above, and all vegetable mould or other organic matter must be removed from the ground before the building is commenced. It is recommended that the sleepers should be charred on the surface before being laid to prevent them from being attacked by dry-rot.

Double-floors are those in which the floor-joists and ceiling-joists are quite distinct, being notched and spiked to stronger timbers called *binders*, which are laid from wall to wall, and placed from 5 ft. to 10 ft. apart. Fig. 2 shows

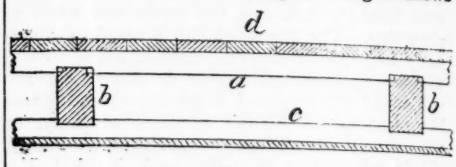

Fig. 2.

section of a double-floor taken across the binders, *b*; *a* being the floor-joist notched upon the top of the binders, *d* the floor-boards, *c* the ceiling joist notched to the underside of the binders. Fig. 3 is a section taken at right

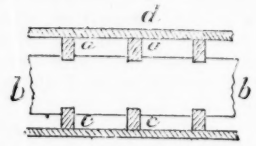

Fig. 3.

angles to the previous one, and across the joists *a* and *c*, *b b* representing the binder taken longitudinally. This kind of floor is most effective for preventing the passage of sound, and also for preserving the ceiling from being injured by cracks. The following are the depths that may be given to the binders when placed 6 ft. apart according to the length of span for ordinary house floors, the breadth being supposed to be 6 in. in all cases; for 12 ft. bearing, 11 in. deep; for 15 ft., 13 in. deep; for 18 ft., 16 in. deep. The floor-joists may be 4½ in. by 2 in., and the ceiling-joists 3 in. by 2 in. If the binders are placed further apart than 6 ft., their scantling must be increased accordingly, and that of the floor-joists must be as given above for single joisted floors.

If the floor has to carry heavy weights, as in warehouses, the scantling of the binders and floor-joists must be increased; for ordinary warehouses, binders having a 10 ft. bearing require to be 12 in. deep by 10 in. wide if placed 6 ft. apart; for 15 ft. bearing they should be 12 in. wide by 15½ in. deep; and for 20 ft. bearing they require to be 14 in. wide by 19½ in. deep. The floor-joists having 6 ft. bearing should be 9 in. deep by 3 in. thick.

In framing these floors the notching out of the joists where they rest on the binders should be as small as possible, since the more we cut away the weaker they become; a notching of 1 in. in depth will generally be ample, and a notching, 1 in. square, may be cut out of each side of the binder, so as to allow the full depth of the joist to rest upon it, as shown at *b* in fig. 2.

Sometimes the floor-joists are omitted altogether, and floor-boards, 3 in. thick, laid directly on the binders, which, in that case, must not be placed more than 3 ft. apart; this method, however, is not an economical one as far as quantity of material is concerned, although there is less labour required in the construction; it is only employed where an extra thickness of floor-board is necessary from the heavy wear and tear to which the floor is subjected.

Framed-floors, properly so called, are those in which the binders do not rest directly on the walls of the building, but have their ends framed into larger beams, called *girders*, laid across from wall to wall. This method is generally used where the span between the walls is very considerable. The method of framing the binder into the girder is shown on fig. 4, where *G* represents the cross-section of the girder, *B* the binder placed lengthwise at right angles to the girder; the tenon *a* should be about one-sixth the depth of the binder, and should be cut at one-third of its depth from the bottom; it should enter the girder as near as

possible to the middle of the depth of that beam which is the part where the girder is subjected to the least strain. The floor-joists *b* are notched on the top of the binders as before

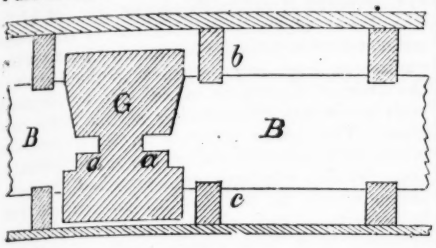

Fig. 4.

described, unless thick boards are used for the flooring and nailed upon the binders themselves, in which case the top of the binders must be placed on the same level as the top of the girders. If there is to be a ceiling below, then the ceiling-joists *c* must be fixed to the bottom of the binders, and must be of sufficient depth to clear the bottom of the girder as shown in the figure.

The scantling of the girders depends upon the distance they are placed apart, the length of bearing or span between the walls or supports, and the loads they have to carry. When placed 10 ft. apart from middle to middle the scantling of girders for ordinary floors, allowing 1 cwt. as the load on every square foot of flooring, should be as follows:—For 17 ft. bearing, 12 in. wide by 13 in. deep; for 20 ft. bearing, 12 in. wide by 15 in. deep; for 22 ft., 12 in. by 16 in.; for 25 ft., 12 in. by 18 in.; for 30 ft., 15 in. wide by 22 in. deep. If the floor has to carry very heavy loads, as in warehouses, factories, and such like buildings, the additional strength may be obtained by placing a pillar of wood or iron under the centre of the girder, by which means it is enabled to carry four times as much load as before. If the length of the pillar is 12 ft., and made of oak, it should be $6\frac{3}{4}$ in. square for a girder of 20 ft. bearing, and $7\frac{1}{2}$ in. square for a girder of 30 ft. bearing.

When timbers of large scantling are employed for girders it is best to saw them down the middle longitudinally, reverse the ends and bolt them together, with slips of wood between the two halves to keep them about an inch apart, the saw-cut being vertical. By this means the carpenter is enabled to see whether the baulk is sound in the middle, as it is in the centre that decay usually commences. By reversing the ends the strength of the beam is more equalised; and by leaving a space between the halves the air is allowed to circulate, and prevents decay. The strength may be somewhat increased by fixing an iron tie-rod between the two halves of the girder, in the manner shown on fig. 5, two pieces of iron being fixed

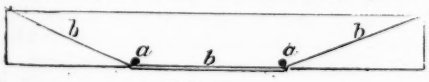

Fig. 5.

at *a* on the bottom edge of the beam, the rod *b* being passed under them and bent at an angle, and secured at the top ends of the beam by means of nuts and screws, which enable it to be tightened up; by this means a slight camber or rise in the middle can be given to the beam, and its stiffness considerably increased. This method is called trussing a beam, and a girder so treated is termed a *trussed girder*.

A method of increasing the stiffness of a girder is shown on fig. 6; the beam being

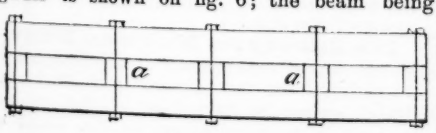

Fig. 6.

sawn in two, and the saw-cut being placed horizontally; the two halves are kept apart by blocks of wood, *a*, which increase its depth, and thereby the resistance of the beam to flexure, which, as we shall presently see, varies as the cube of the depth. Light iron bolts are used to hold the two halves together, the bolts passing through the intermediate blocks. By this method we can get a beam of greatly increased strength and stiffness, with very little more material than is used in a much weaker beam, as the middle of a beam has very little strain put upon it when loaded, and the removal of that portion takes very little away from its strength.

TEACHING PERSPECTIVE.

Sir,—The diagrams and explanations giving a simple lesson in perspective in the Student's Column of your last issue show lucidly the system as adopted by architectural draughtsmen, and as taught in architects' offices. The principle can be mastered in half an hour, and is applicable to the most elaborate architectural drawing. Students who have not been taught this practical way must be indebted to you for publishing it.

I wish, however, to call your attention to the fact that the examination papers issued by the Science and Art Department at South Kensington to schools are prepared in such a way as prevents students from applying your system; and further, I am informed, by students who have attempted to work out their papers by this simple rule, that they have not passed, although able to draw correct archi ectural perspectives. I have also found from experience that students who had learned the complex mathematical system of the text-books used and taught from in schools of art, and had received the certificate of the Department, could make no *practical* use of the rules they had been taught.

I am in hopes you will use the powerful influence of your journal to get such a stumbling-block removed from the path of students.

David Barclay, F.R.I.B.A.

Glasgow, Sept. 27, 1884.

*** We have always considered, and have frequently said, that the study of perspective is rendered needlessly difficult by those complicated systems and diagrams which make a mystery of what really is a simple principle, capable of universal application when once grasped.

THE SOANE MEDALLION COMPETITION.

Sir,—I should be much obliged if any reader could tell me whether persons other than students or members of the Royal Institute of British Architects can go in for the "Soane Medallion" competition. Jack.

*** The competition for the Soane Medallion is open to *all members of the profession under the age of thirty years.* See "General Conditions" and particulars, which may be had for a few pence by writing to the Secretary of the Institute.

MEETINGS.

Monday, October 6.

King's College, London.—Mr. W. G. McMillan on Fuel (I). 7 p.m.

Tuesday, October 7.

Royal Victoria Hall (Waterloo-road).—Mr. P. H. Carpenter on "Our Bodies, and How they are Kept Going" (Penny Science Lecture). 8.30 p.m.

Wednesday, October 8.

Crystal Palace School of Art.—Mr. G. Richards Julian on "Styles of Architecture and their Relation to the Art of Landscape Gardening" (I). 4 p.m.

Friday, October 10.

Architectural Association.—Annual *Conversazione*, in the galleries of the Royal Institute of Painters in Water Colours, Piccadilly. 8 p.m.

Miscellanea.

Builders' Clerks' Benevolent Institution. A special general meeting of the subscribers and donors was held at the new offices of the Institution, 21, New Bridge-street, Blackfriars, on Tuesday evening last, September 30th, when Mrs. M. E. Robinson and Mrs. A. P. Friend were duly elected pensioners on the Relief Fund. At the close of the proceedings, a vote of thanks was tendered to Mr. Thos. Stirling (who was supported by Mr. J. Howard Colls, Mr. H. Weller, of the Weston Quarries, and other gentlemen) for his kindness in presiding in place of the president, Mr. Joseph Randall, who was unable to attend.

Typhoid Fever in Kidderminster.—In consequence of the alarming spread of typhoid fever in Kidderminster a Local Government Board Inquiry is being held by Dr. Parsons, and the Corporation and their sanitary officers are now engaged in investigating the cause of the epidemic. The Corporation have called in to advise them Mr. Edward Pritchard, C.E., of Birmingham.

Glasgow Institute of Architects.—On the 25th ult. the annual excursion of the Glasgow Institute of Architects took place. The party started by the 9.50 train from the Central Station, and arrived at Merchiston, near Edinburgh, about eleven o'clock. From Merchiston they drove to Dalmeny Church, where nearly an hour was spent in examining this interesting building, claimed to be the most perfect remaining example of Norman work in Scotland. Lunch was served at South Queensferry, and the party then drove on to Hopetoun House, the seat of the Earl of Hopetoun. The central portion of this large building was designed by Sir William Bruce in 1702, and the wings by Robert Adam at a later date. The collection of paintings and other works of art was examined with great interest. About half-past three the party arrived at the Forth Bridge works, where they were met by Mr. Arrol, and the rest of the afternoon was syent in a careful examination of this undertaking. A drive to Edinburgh, and dinner in the Windsor Hotel, under the presidency of Mr. James Thomson, F.R.I.B.A., closed the excursion, and the party returned by an evening train to Glasgow.

Art Copyright.—A telegram from the Brussels correspondent of the *Daily News* states that at the Wednesday morning sitting of the Literary and Artistic Congress, in the discussion of the question of artistic property it was admitted that there are two kinds of property involved,—the one material (that of the picture or statue sold), the other immaterial (that of the conception of the work of art). It was impossible for the congress to settle the relations between the artist and the purchaser. After a debate in which several members took part, the congress voted two resolutions proposed by the committee:—First, the right of reproduction of a work of art belongs to the artist independently of the material property of the work. Consequently, the disposal of a work of art does not imply on the part of the artist, unless in case of express stipulation, the alienation of the right of reproduction. Secondly, All reproduction unauthorised by the artist, even by a different art, is an infringement of the artist's right.

Cumberland and Westmoreland Archæological Society.—The second two days' meeting of the season of the Cumberland and Westmoreland Antiquarian and Archæological Society commenced on the 25th ult. Under the guidance of Dr. Parker the company went, in the first place, to Waberthwaite from Eskmeals, visiting the church and cross. After luncheon they went along the new road which Lord Muncaster has made through his park at Muncaster Head, and visited the Roman tile-kiln which was found when excavating the new road. This kiln was explained by Dr. Parker and Mr. Ross, Lord Muncaster's steward. From here the company went to Dalegarth Hall, and Mr. C. J. Fergusson, of Carlisle, and Dr. Parker read papers. The visitors then proceeded to Hardknott Camp, and to Seascale, where, after dinner, a meeting for the transaction of business was held, Dr. Parker presiding.

A Man Killed by Electricity at the Health Exhibition.—Mr. A. Braxton Hicks, the deputy-Coroner for Westminster, held an inquiry on Wednesday at St. George's Hospital respecting the death of Henry Pink, working electrician, who was killed at the Health Exhibition by an electric shock on Saturday evening last. The deceased has been engaged at a powerful dynamo machine, which generated a current utilised for illuminating purposes. He had informed his father that he was acquainted with the working of the machinery, but it appeared by some carelessness or inadvertence he placed his hands in such a position that the current was diverted, and, passing through his body, killed him. The jury returned a verdict of "Accidental death," expressing their opinion that, though there was no danger to the public, a notice that the machines should not to be touched with both hands at the same time should be posted at the spot.

The National Art Library.—The new rooms devoted to the National Art Library at South Kensington Museum were opened for public use on Tuesday last. There are in the library upwards of 60,000 volumes and over 190,000 drawings, designs, engravings, prints, and photographs, all bearing upon art. The number of readers has reached a normal yearly average of 24,000. The new reading-rooms will accommodate about 160 readers with comfort.

The Fatal Accident in a Board-School Playground.—Last week Dr. Diplock, the coroner for Middlesex, concluded the inquiry into the death of the little girl who was killed by the breakage and fall of a pole of the "giant's stride" which formed part of the gymnastic apparatus in the playground of a Board-school at Queen's Park, Paddington. On behalf of the School Board, Mr. Spencer Chadwick, of 17, Parliament-street, Westminster, architect and surveyor, deposed that he had seen the pole, and was of opinion that had it been in frequent use it would have shown signs of weakness before it fractured, and had the pole been moved, as it would have been by use, the water would have found its way down to a lower level than where it had evidently lodged, and that portion where the fracture is would then never have become so saturated. The pole was comparatively sound a few inches below the fracture, and was a good piece of wood. On the other hand, William Brace was called, and said that he was a timber foreman, and had been thirty-two years in the business. He had examined the broken pole, and his opinion was that the timber was put into the ground when it was wet. It was also tarred, or "pickled," which caused the sap to flow to the heart of the wood and perish the grain.—By jurymen: A pole planted in that condition would rot in five to seven years. That in question was yellow Dantzig (spruce) (?). In his opinion, it had never been properly inspected.—The jury announced as their verdict, "Accidental death," expressing the opinion that the School Board for London was to blame for not providing efficient inspection.

Amusements for the People.—The concert season at the Royal Victoria Hall and Coffee Tavern (long known as the Victoria Theatre), Waterloo Bridge-road, commenced on Thursday last, Oct. 2. This and the second Thursday evening concert, to take place on Thursday next, are under the charge of Mr. Lenthal Swifte. Arrangements for several succeeding concerts are being rapidly completed with well-known singers. Much care is being given to the arrangement of the programmes so as to secure all possible brightness and variety. The "penny science lectures" have also been commenced, the first one having been given by Dr. Andrew Wilson on "Our Bones: what they are, and how they are made." The lecture for Tuesday next will be by Mr. P. H. Carpenter on "Our Bodies, and how they are kept going." The lecture on Tuesday, Oct. 14, will be on "Air and Ventilation," by Mr. J. M. Thomson, F.R.S.E.

East London Union for Advanced Education.—This society is commencing a series of evening classes on Monday evening next at Dempsey-street, Jubilee-street, Mile End, and we learn that the Council have secured the services of Mr. Howlett, practical carpenter and builder, certificated by the Science and Art Department and the City and Guilds of London Institute, to teach Building Construction and Carpentry during the course extending from October to May. The Council have also secured the services of Mr. G. C. Dymond, practical engineer, certificated by the Science and Art Department, to teach Machine Construction, Mechanical Engineering, and Steam; and those of Mr. Cooms, architect, to teach Practical, Plane, and Solid Geometry. The Hon. Secretary of the classes is Mr. F. H. Parsons, White Horse-lane, E.

The Societe d'Encouragement pour l'Industrie Nationale, founded in 1801, and declared of public utility by a decree of 21st April, 1824, has determined the subjects for the competition of 1886. The large medal, bearing the image of Jean Goujon, will be devoted to Architecture and the Fine Arts. The following have been the recipients of this prize:—1870 (Commerce), M. F. de Lesseps; 1870 (Chemistry), M. H. Sainte Claire Deville; 1872 (Agriculture), M. Boussingault; 1873 (Physics), Sir Charles Wheatstone; 1875 (Commerce), Mr. Jacques Siegfried; 1876 (Mechanics), M. H. Giffard; 1877 (Chemistry), Mr. Walter Weldon; 1880 (Fine Arts), M. Charles Garnier. Further information may be obtained at, and descriptions should be addressed to, the offices, 6, Place Saint-Germain des Prés, Paris.—*Society of Arts Journal.*

Crystal Palace School of Art, Science, and Literature.—The programme for the twenty-fifth session, 1884-85, includes a course of six lectures on "Styles of Architecture and their Relation to the Art of Landscape Gardening," by Mr. G. Richards Julian, A.R.I.B.A.

Building Estates at Clapham and Stockwell.—The estate on the east side of High-street, Clapham, formerly belonging to the trustees of the Clapham Grammar School, is about to be built upon, having just been disposed of on lease. The estate covers an area of between two and three acres, and has been laid out for the erection of about sixty houses, letting at rentals ranging from 50*l.* to 60*l.* per annum. A new road, 40 ft. in width, called St. Luke's-road, approached from High-street, passes through the centre of the estate, and is at present being drained and paved by the freeholder. The houses are intended to be built with red brick. The architect to the estate is Mr. W. Randal Lacy, and amongst the principal lessees and builders are Mr. H. A. Brown and Mr. Bach, both of Clapham.——The Stockwell Small-pox Hospital in Landor-road, about midway between the Brixton and Clapham roads, seems no longer to have any terrors for the speculative builder. Within the last twelve months upwards of 500 houses have been erected on two large estates, which have been laid out immediately in front of the Hospital, and tenants are found for the houses almost before they are completed. What has for many years been known as Theobald's Farm, immediately adjoining the Hospital, on the east side, has now got into the hands of the builder, and the stables and other buildings on the estate are now in course of demolition preparatory to the laying-out of several new streets, in which between 300 and 400 houses will shortly be erected.

The Surveyorship of Chelsea.—At the meeting of the Chelsea Vestry on the 16th inst. consideration was given to the letter from Mr. George H. Stayton, C.E., dated August 5th (to which we have previously referred), resigning the office of Engineer and Surveyor to the Board. Mr. Churchwarden Wheeler moved "That Mr. Stayton's resignation be accepted by the Board, with very sincere regret, accompanied with every expression of their high appreciation of the talents he has displayed during the nine years and a half he has held the appointment, and with their best wishes for his health, prosperity, and success in any sphere of action he may hereafter enter upon." In supporting the resolution, Mr. Wheeler spoke at length upon the importance of the works carried out by Mr. Stayton, of his successful administration, and of the great regret that all felt at his departure. Mr. Davidge seconded the resolution, which was agreed to *nem. con.*, and it was determined to engross it, and present it to Mr. Stayton. Mr. Stayton at the same meeting submitted to the Vestry a report which he had been instructed to make to them as to the electric lighting at Colchester, to which we may return.

Conservatory at Bradford.—The Mayor of Bradford has just added a spacious conservatory to his residence at Daisy Hill, Bradford. All the latest improvements in ventilating apparatus and hot-water heating have been introduced. The conservatory may be described as a rectangular building, 40 ft. long by 25 ft. broad. The whole work has been designed and carried out by Messrs. Messenger & Co., horticultural builders, of Loughborough, who have also carried out the heating of the building with their patent elastic jointed pipes.

University College, Bristol.—As will be seen by an advertisement in another column, a special course of instruction has been arranged for those intending to become architects, which has received the entire approval of local architects. Among other lectures and classes are included lectures on the history of architecture, and also the theoretical and practical treatment of the science of building. The engineering department of the college also includes special courses for those intending to become civil, mechanical, or electrical engineers, or surveyors.

The New Council Chamber of the City of London was opened on Thursday last, the 2nd inst. The building has already been pretty fully described in our columns, but there are a few details of interest to which we may return. A large view of the interior was published in the *Builder* nearly a year ago (Dec. 1, 1883). The building reflects much credit on the City Architect, Mr. Horace Jones.

"Sanitation at Brighton."—As to the notice of Mr. Chappell's new flats at Brighton under the above heading in last week's *Builder* (p. 421), we are asked to say that they were dried by Messrs. A. Dreyfus & Co. with "Ligny's Patent Process."

New Bank of Victoria, South Melbourne. One of the newest buildings in the new city of South Melbourne is that lately erected for the Bank of Victoria. It has a frontage of 40 ft. to Clarendon-street, with an elevation of 41 ft. The lower story is carried out in the Doric order, set on a polished Malmsbury base-course, having an imposing entrance to the banking-chamber, with columns on each side, surmounted with pediment, terminating with a Doric cornice. The upper story is in the Corinthian order, with columns above the main entrance, and circular windows and enriched impacts, above which is the Corinthian cornice and balustrade. The whole building (including fittings) have been erected under the supervision of and from plans drawn by Mr. W. S. Law, architect, South Melbourne. Mr. C. H. Martin is the contractor for the buildings, and the fittings were executed by Mr. Charles Beecham, of Post-office-place. The building will cost about 3,000*l.*—*Australasian Sketcher.*

Phosphorised Brass Wire.—The advantages of phosphorised wire are that it is very tough, takes a high polish, and does not corrode. The operation consists in placing bronze or brass wire in a solution of from 1 to 5 per cent. of phosphorus in either bi-sulphide of carbon or olive oil, together with 5 to 10 per cent. of sulphuric acid and 85 to 95 per cent. of water, until the metal takes up the phosphorus. The wire is then drawn to one number finer, and placed in a closed retort, with a thin layer of phosphorus, so that the vapour may spread over the surface of the wire. It is next packed in charcoal and kindled, and, after proper annealing, the wire can be again drawn to a finer number, the process being repeated until the desired fineness is obtained.

Commercial Failures.—According to *Kemp's Mercantile Gazette*, the number of failures in England and Wales gazetted during the week ending Saturday, September 27th, was sixty-one. The number in the corresponding week of last year was 147, showing a decrease of eighty-six, being a net decrease in 1884, to date, of 5,033. The failures in the building trades last week numbered four, as against eighteen and fifteen in the corresponding weeks of 1883 and 1882 respectively.

Westminster Technical Schools.—The Technical Classes in connexion with the United Westminster Schools were opened on Wednesday evening by Sir J. C. Lawrence, bart., M.P., Mr. W. E. M. Tomlinson, M.P., and other Governors. The classes are held in the evening. The prospectus sets forth the very complete scheme of classes and lectures which has been arranged, the subjects including Drawing, Building Construction, and Machine Construction and Drawing. The fees are low.

Westminster Abbey.—The stone which is being used in the restoration works now in progress at Westminster Abbey is, we understand, being supplied by Mr. T. P. Lilly, of the Chilmark and Wardour stone quarries, Wiltshire. Mr. Lilly has supplied stone for a long time for restoration at Westminster Abbey, the Chilmark stone having been used by Messrs. H. Poole & Sons, the Abbey masons, for many years, notably in the Chapter House, the south transept front, and the north porch.

Alnwick Water Supply.—For some time past considerable inconvenience has been felt in summer time in consequence of insufficiency of water at Alnwick, and the local authorities have therefore resolved to go thoroughly into the question of increased supply and new waterworks. They have called in Mr. J. P. Spencer, C.E., of Newcastle-on-Tyne, to report upon the whole subject, and advise them as to the best means of providing for the requirements of the district.

The Statuary for Blackfriars Bridge.—The groups of equestrian statuary designed for the pedestals at the extremities of Blackfriars Bridge appear to have been decided on, and to include representations by Mr. Brock of Edward III.; by Mr. Hamo Thornycroft of Edward I.; by Mr. Birch of Henry V.; and by Mr. Belt of William the Conqueror.—*Athenæum.*

Exhibition at Eastbourne.—The Eastbourne Arts, Sciences, and Sanitary Exhibition was opened on the 23rd ult., in the Pavilion, Devonshire Park. Lectures on subjects more or less bearing upon the objects of the Exhibition have been delivered.

Mr. Thomas W. Cutler.—We learn with regret, which will be shared by many of our readers, that Mr. T. W. Cutler lies seriously ill at his house in Queen-square, Bloomsbury.

Photographic Society of Great Britain. The private view of this year's exhibition takes place to-day (Saturday), October 4th. The exhibition will be opened to the public on Monday next, and will remain open until the 13th of November.

The Inner Circle Railway.—The Inner Circle completion line was opened for experimental traffic on Wednesday morning. In the event of the directors' expectations being realised, the line will be available for public traffic on Monday next.

CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Broken Granite	Aldershot Local Board	W. L. Coulson	October 6th	ii.
Effluent Sewer	Warwick Town Council	E. M. Richards, C.E.	do.	ii.
Filter Bed	do.	do.	do.	ii.
Kerbing, Tar-Paving, &c.	Lewisham Brd. of Wks.	.....	October 7th	ii.
Building Room, Lambeth Infirmary	Guardians	.....	October 8th	ii.
Paving and Sewage	St. Luke's Vestry	*Official*	do.	xiv.
Workhouse at Mitcham	Grdns. of Holborn Un.	H. Saxon Snell & Son	do.	xiv.
Erection of Houses, Shops, &c.	.....	Geo. Fuller	October 9th	ii.
Supplying and Laying Cast-Iron Pipes	Hartley Wintny R.S.A.	J. R. Sisterson	October 11th	ii.
Brick Sewers	Birmingham Town Cncl.	W. S. Till	October 13th	ii.
Road Making and Paving	Camberwell Vestry	*Official*	do.	xiv.
Paving	Willesden Local Board	O. Claude Robson	October 14th	xiv.
Construction of Dock	Barry Dock & Railway Company	J. W. Barry & H. M. Brunel	do.	xiv.
New Post-office, Watford	Commissnrs. of Works	*Official*	do.	ii.
Structural Alterations, Town Hall	St. Helen's Corporatn	E. Kirby	do.	ii.
Heating and Ventilating	West Ham Local Brd.	Lewis Angell, C.E.	do.	ii.
Tiled Dadoes	St. Helen's Corporatn	G. J. C. Broom, Assoc. M.I.C.E.	October 15th	ii.
Marble Linings	Fulham Board of Wrks	*Official*	do.	xiv.
Cleaning, Painting, &c.	Croydon Town Council	do.	October 16th	ii.
Wood-Panelling	Commissnrs. of Works	do.	October 18th	ii.
River Wall	Torquay Local Board	T. S. Weeks	October 20th	ii.
Repairing Tramways	Commissionrs of Sewers	*Official*	October 21st	ii.
Masonry	Brentford Local Board	— Lacey	do.	ii.
Drainage Works and Extension of Baths	Darlaston U. S. A.	E. Pritchard, M.I.C.E.	October 23rd	xiv.
New Post-office, Victoria Docks	R. W. Hillman, Solicitr	Not stated	October 25th	ii.
Cast-Iron Pipes	Boscmbe Con. Land Soc.	R. G. Pinder	Not stated	ii.
Sewers, Gullies, &c.				
Kerbing, Chanellings, &c.				
Steam-Engines, Boilers, &c.				
Re-seating, &c., Parish Church, Lyme Regis				
Roads and Sewers				

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Applications to be in.	Salary.	Page.
Surveyor	Chelsea Vestry	October 14th	400*l.* per annum	xviii.
Borough Surveyor	Grimsby Town Council	October 18th	200*l.* do.	xviii.

TENDERS.

For building Convalescent Hospital at Winchmore Hill, for the Metropolitan Asylums Board. Messrs. Pennington & Bridgen, architects:—

Higgs & Hill	£91,840	0	0
Lovatt	91,316	0	0
Parnell & Son, Rugby	89,396	0	0
J. Morter	87,684	0	0
Stevens & Bastow	86,591	0	0
Wm. Brass	85,871	0	0
G. Shaw	85,800	0	0
Chappell & Son	85,444	0	0
W. & J. Croaker	84,889	0	0
B. E. Nightingale	84,839	0	0
Wm. Shurmur	84,700	0	0
J. Lawrence	84,000	0	0
Neall & Son	81,850	0	0
Perry & Co.	81,000	0	0
Southern	80,170	0	0
E. C. Howell & Son	79,900	0	0
Wall Bros.	79,427	0	0
D. D. & A. Brown	78,557	0	0
Bull & Co.	74,000	0	0
Martin	64,159	0	0

For new Board Schools, Queen's Head-street, for the School Board for London. Mr. E. R. Robson, architect:—

L. H. & R. Roberts	£13,667	0	0
J. & J. Greenwood	13,550	0	0
W. Goodman	13,550	0	0
W. Downs	13,476	0	0
Bangs & Co.	13,326	0	0
Scrivener & Co.	13,229	0	0
J. W. Hobbs	13,158	0	0
G. J. Williams & Son	13,055	0	0
J. Holloway	12,990	0	0
W. Shurmur	12,978	0	0
Stimpson & Co.	12,969	0	0
Lawrence & Sons	12,953	0	0
S. J. Jerrard	12,933	0	0
Perry & Co.	12,915	0	0
C. Wall	12,850	0	0
J. Grover	12,846	0	0
Lathey Bros.	12,787	0	0
Wall Bros.	12,745	0	0
W. Johnson	12,700	0	0
Atherton & Latta	12,700	0	0
C. Cox	12,460	0	0
J. R. Hunt	12,389	0	0

For construction of reservoir, filter-beds, conduit, and the laying of eleven miles of cast-iron pipes, in connexion with the Stratford-on-Avon Water Works. Contract No. 4. Mr. E. Pritchard, C.E, engineer, Westminster and Birmingham:—

Hilton & Sons, Birmingham	£23,170	0	0
Crea & McFarland, Westminster	20,455	4	5
Evans Bros., Wolverhampton	17,600	0	0
B. Cooke & Co., London	16,700	0	0
Currall & Lewis, Birmingham	16,300	0	0
John Jevons, Dudley	15,282	18	3
George Law,* Kidderminster	14,077	0	0

* Accepted.

For the erection of a police court and offices in West Ham-lane, for the West Ham Local Board. Mr. Lewis Angell, architect. Quantities by Messrs. R. L. Curtis & Son:—

J. W. Wyles	£6,673	0	0
A. Reed	6,470	0	0
J. G. Horlock	6,300	0	0
F. Deacon	5,995	0	0
Thomerson & Son	5,975	0	0
Staines & Son	5,964	0	0
Scharien & Williams	5,690	0	0
Holloway	5,690	0	0
C. Barnes	5,659	0	0
J. R. Hunt	5,587	0	0
W. Gregar	5,560	0	0
G. W. Beale	5,557	0	0
D. D. & A. Brown	5,533	0	0
O. T. Gibbons	5,500	0	0
Balsam Bros.	5,459	0	0
J. Morter	5,421	0	0
Magee & Co.	5,397	0	0
J. J. Robson	5,324	0	0
Howell & Son	5,300	0	0
England & Thompson	5,299	0	0
M. Gentry	5,250	0	0
C. Cox	5,220	0	0
Palmer & Son (accepted)	4,995	0	0

For the erection of lithographic and printing works and offices at Middlesbrough. Mr. John W. Alexander, architect, Middlesbrough and Stockton-on-Tees. Quantities by Mr. Wm. Lunn, Kidderminster:—

T. D. Ridley, Middlesbrough	£4,725	0	0
J. Perks, Stockton	4,353	12	0
Craggs & Benson, Stockton	4,334	10	0
J. Lord, Middlesbrough	4,276	0	3
R. Wilkinson, Middlesbrough	4,213	0	0
T. Dickinson, Saltburn	4,210	0	0
E. Atkinson, Middlesbrough	4,100	0	0
J. R. & W. Sturdy, Middlesbrough	4,087	10	0
J. Johnson, Acklam-terrace, Middlesbrough	4,075	8	0
A. White, Gainsborough	3,995	10	0

Revised estimates as per reduced quantities:—

E. Atkinson	3,570	0	0
J. Johnson	3,506	10	0
A. White	3,460	6	0
J. R. & W. Sturdy (accepted)	3,376	0	0

For widening, altering, and removing a portion of an existing bridge over the Pudding Mill river, in Marsh Gate-lane, Stratford, E., for the West Ham Local Board. Mr. Lewis Angell, C.E., engineer:—

G. Potter	£430	0	0
W. Jones	349	19	11
Schofield & Co.	325	0	0
G. Bell	291	5	1
Wm. Harris	282	0	0

Accepted for broken granite flints, &c., for the Richmond Urban Sanitary Authority. Mr. Walter Brooke, surveyor:—

Downs, Kennedy, & Co., Richmond, at prices as follow, viz.:—granite (broken), 12s. 9d. per cubic yard; chalk flints, 4s. 8d.; brown flints, 4s. 5d.; granite siftings, 8s. 11d.; hill picked flints, 7s. 3d.

For girls' and infants' department of Board Schools Edward-street, Deptford, for the School Board for London Mr. E. R. Robson, architect:—

J. W. Hobbs	£11,400	0	0
Turtle & Appleton	11,094	0	0
J. Grover	10,567	0	0
C. Cox	10,536	0	0
Stimpson & Co.	10,533	0	0
Scrivener & Co.	10,520	0	0
W. Downs	10,484	0	0
Wall Bros.	10,462	0	0
Atherton & Latta	10,400	0	0
W. Bangs & Co.	10,340	0	0
C. Wall	10,330	0	0
H. Hart	10,300	0	0
Lathey Bros.	10,232	0	0
W. Johnson	10,182	0	0
Kirk & Randall	10,114	0	0
S. J. Jerrard	10,039	0	0
W. Oldrey	10,000	0	0
J. Holloway	9,861	0	0

For rebuilding workshops and organ-room, Kings-road, Camden Town, for Messrs. Goodall, Mr. Silvester C. Capes, architect. No quantities:—

Wall Bros.	£540	0	0
A. G. Bolding	517	0	0
Oldis Bros.	460	0	0

For alterations to 3, Jewry-street, Aldgate, for the Great Tower-street Tea Company. Mr. Richard Peters, architect, 72, Wool Exchange, Coleman-street, E.C.:—

Ormson & Co.	£1,100	0	0
Richardson Bros.	888	0	0
Kemp	812	0	0
Watson (accepted)	731	0	0

For the erection of church and presbytery, Broxwood, near Pembridge, Herefordshire. Mr. C. F. Hansom, architect, Clifton, Bristol. Quantities supplied:—Bullock & Co., Wellington, Salop

J. Sandford, Letton, near Hereford	£2,738	0	0
J. Wilkins, Bristol	2,725	1	5
R. Morgan, Kington, Herefordshire	2,710	0	0
C. Edwards, Leominster	2,539	0	0
J. Perrott, Bristol	2,477	14	8
J. Williams, Knighton, Radnorshire	2,294	0	0
H. Welsh, Hereford (accepted)	2,218	7	0
	2,200	0	0

For the pulling down and rebuilding of the Raven Inn, situate in Rawson-street, New Basford, Nottingham, for Mr. Wm. Maltby. Mr. Herbert Walker, C.E., architect, Nottingham:—

Dudson & Parrish	£1,369	13	9
E. Hind	1,317	0	0
Wooll Bros.	1,270	0	0
Bell & Son	1,260	0	0
H. Vickers	1,253	0	0
J. R. Morrison	1,240	0	0
J. F. Price	1,230	0	0
Wheatley & Maule	1,220	0	0
G. Brownsell	1,220	0	0
S. J. Cargell	1,200	0	0
H. Scott	1,179	0	0
Bains & Turton	1,170	0	0
W. H. Taylor	1,122	10	0
W. Bailey	1,097	0	0
J. Noble (accepted)	1,089	0	0

[All of Nottingham.]

For the erection and completion of the Smith's Arms Inn and four sale shops with dwelling-houses, to be situate in Radford-road, Hyson Green, Nottingham, for Mr. John Robinson. Mr. Herbert Walker, architect:—

Wooll Bros.	£3,200	0	0
Lynam & Kidd	3,185	0	0
Bell & Sons	3,114	0	0
Bains & Turton	3,100	0	0
H. Scott	3,050	0	0
H. Vickers	3,045	0	0
E. Hind	3,021	0	0
Wheatley & Maule	3,020	0	0
J. J. Adams	3,000	0	0
G. Saddler	2,997	10	0
W. Bailey	2,996	0	0
J. Noble	2,940	0	0
J. F. Price	2,860	0	0
Ireson, Wade, & Gray	2,775	0	0
Stainforth Bros.	2,765	0	0
Houldsworth,* Hucknall Torkard	2,746	13	10
Cuthbert Bros.,† Hyson Green	2,620	0	0

* All others of Nottingham. † Accepted.

For villa on the Haile Park Estate, Hale End, Walthamstow. Mr. W. H. Punnett, architect, 15, King-street, Cheapside:—

John Church	£880	0	0
J. Bowden & Son	795	0	0
J. A. Reed	710	0	0
A. Barton	518	0	0
J. Abbott	470	0	0
E. Fuller	457	0	0
G. Wright & Co.	431	0	0

For proposed new building at Christ's Hospital, Hertford. Mr. Henry S. Legg, architect:—

L. & W. D. Patman	£1,048	0	0
Fred. Bitch	1,045	0	0
Henry Ekins	1,037	0	0
Henry Norris	1,030	0	0
Thomas Hunt	973	0	0

For the erection of school at Rose Hill, Ipswich, for 164 infants, for the Ipswich School Board. Mr. E. F. Bishop, architect, Museum-street, Ipswich:—

Wm. Graystone	£1,885	0	0
G. Kenney	1,660	0	0
T. Thwaites	1,640	0	0
R. S. Smith (accepted)	1,393	12	6
C. O. Wyatt	1,196	0	0

[All of Ipswich.]

For rebuilding the Black Bull Tavern, High-street, Lewisham, for Mr. George Shaw. Mr. Horace T. Bonner, architect, Lewisham:—

Major	£1,147	0	0
Amer	1,100	0	0
Staines & Son	1,066	0	0
Jerrard	1,043	0	0
Kirk	997	0	0
Hubble & Trott	996	0	0
Burman & Son	987	0	0
Holloway	975	0	0

For sewer at Grove Park and Eltham, for the Metropolitan Board of Works. Sir Joseph Bazalgette, engineer:—

Williams, Son, & Wallington	£10,400	0	0 !
Kellett & Bentley	9,050	0	0
Woodhams Bros.	7,865	0	0
G. Felton	7,540	0	0
Mowlem & Co.	7,500	0	0
B. Cooke & Co.	7,300	0	0
T. S. Ridley	7,251	0	0
J. Hayward	7,155	0	0
J. W. & J. Neave	6,988	0	0
Bottoms Bros.	6,858	0	0
W. J. Butterill	6,467	0	0
McKenzie & Co.	6,130	0	0
Beadell Bros. (accepted)	5,836	0	0
J. Roberts	4,812	0	0 !

For the construction of pipe sewers, manholes, flushing chambers, &c., at Buckhurst Hill, for the Epping Rural Sanitary Authority. Mr. Lewis Angell, C.E., engineer:—

J. C. Trueman	£4,089	0	0 !
G. Pound	3,309	0	0
G. Bell	2,797	0	0
Jesse Jackson	2,666	0	0
J. Steward	2,635	16	9
E. Bentley	2,502	0	0
Cook & Co.	2,488	0	0
Cardus & Prouse	2,484	0	0
Bottoms Bros.	2,469	0	0
J. Bingham	2,428	0	0
J. Dickson	2,400	0	0
Schofield & Co.	2,375	0	0
Killingback	2,349	0	0
G. Egan	2,289	0	0
W. Nicholls	2,284	0	0
J. Adams	2,276	17	4
John Jackson	2,275	0	0
H. Potter	2,230	0	0
Beadle Bros.	2,220	0	0
J. J. McKenzie	2,198	0	0
J. W. & J. Neave	2,194	0	0
H. Saunders	2,148	0	0
A. T. Catley	2,000	0	0
Peill & Son	1,996	0	0
S. & J. Saunders, Hughan-road, Fulham (accepted)	1,894	12	6 !

For alterations, additions, &c., at 55, Porchester-terrace, Bayswater, W., for Mr. E. Schumacher. Messrs. William Wallace & Flockhart, architect. Quantities by Mr. Frederick Thomson:—

Buckridge	£2,841	0	0
Curtis	2,652	10	8
G. Shaw	2,374	0	0
Manley	2,297	0	0
Dowsing & Son	2,186	0	0
E. Toms (accepted)	2,089	0	0

For the erection of house, Sutton Court-road, Sutton, Surrey, for Mr. Chandler. Mr. Herbert D. Appleton, architect, the Wool Exchange, E.C. Quantities by Mr. F. T. W. Miller, Guildhall Chambers, E.C.:—

Hobbs	£1,123	0	0
Redman	1,119	0	0
Ward	920	0	0
Burrage	918	0	0
Smith	895	0	0
Humphris	880	0	0
Potter	794	0	0
Robinson	640	0	0

For making up road on Wright's Park, for the Hornsey Local Board of Works:—

Potter	£663	0	0
Walker	500	0	0
Jackson	495	0	0
Pizzey	493	0	0
McKenzie	440	0	0
Brown	410	0	0

For constructing new roads and surface-water drains at Dartford:—

Beadle Bros.	£465	0	0
Adams	449	0	0
Lansbury	389	0	0
Pizzey (accepted)	383	0	0

For new road and surface drain at Penge:—

Lloyd	£288	0	0
Beadle Bros.	283	0	0
Harris	267	0	0
Bell	255	0	0
Catlin	250	0	0
Marshall	245	0	0
Pizzey (accepted)	243	0	0

For proposed alterations and additions at the Croydon Union Vagrant Wards:—

Hann & Co.	£4,293	0	0
Hill Bros.	4,198	0	0
Howe & White	4,070	9	3
Parker	4,000	0	0
Longley	3,895	0	0
Taylor & Son	3,884	19	9
Sedgwick	3,845	0	0
H. J. Sanders	3,813	0	0
Smith & Bulled	3,789	0	0
E. C. Howell & Son	3,725	0	0
Thos. Dean	3,667	0	0
T. W. Jones	3,629	0	0
G. Stephenson	3,565	0	0
F. Higgs	3,490	0	0
Potter	3,298	0	0

[All amounts net after deducting for old materials.]

For alterations to the Builders' Arms Public-house, Pentonville. Mr. R. A. Lewcock, architect:—

H. J. Backholer	£1,093	0	0
J. Anley	955	0	0
W. Shurmur	945	0	0
E. Toms	873	0	0
Oldis Bros.	850	0	0
Jackson & Todd	795	0	0

For taking up old drains, relaying new drains, and fitting up water-closets, &c., to Great Eastern Hospital, Deptford:—

Maycraft & Co.	£4,859	0	0
Bell	4,496	0	0
Killingback	4,340	0	0
Mowlem & Co.	4,156	0	0
Knight	4,117	0	0
Cooke & Co.	4,090	0	0
Adams	3,999	0	0
Wall Bros.	3,997	0	0
Beech	3,481	0	0
Holland	3,289	0	0
Hare	3,100	0	0
Schofield	3,060	0	0
Ivory	3,043	0	0

For rebuilding premises, Nos. 6 and 6A, Oxford Market, W., for Mr. J. A. Mitchell. Mr. Walter J. Miller, architect:—

E. Conder	£3,777	0	0
Bangs & Co.	3,676	0	0
Patman & Fotheringham	3,573	0	0
Nightingale	3,422	0	0
Scrivener & Co.	3,369	0	0
Manning	3,350	0	0

Special Notice.—Lists of tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, Strand, W.C., not later than four p.m. on Thursdays.

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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

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PERSONS Advertising in "The Builder," may have *Replies addressed to the Office*, 46, Catherine-street, Covent-garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, PREPAID. To countries within the Postal Union, 26s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C

TO CORRESPONDENTS.

Received.—J. B. T.—P. Bros.—P. H. N.—W. W.—C. H. T.—J. P.—W. B. G. B.—D. L. A.—C. & M.—M. P. B.—J. H.—Justitia.—G. N.—Nemo (send name and address).—J. & J. S. E. (next week).—Stentor (too late for this week).—W. G. (MS. received).—E. G. (your letter painfully true, we fear, as to facts, but the deductions therefrom quite untenable, not to say mischievous).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read a public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

Best Bath Stone.
WESTWOOD GROUND,
Box Ground, Combe Down,
Corsham Down,
And Farleigh Down.
RANDELL, SAUNDERS, & CO., Limited,
Corsham, Wilts. [ADVT.

Box Ground Stone
Is the Best for Use in all Exposed Positions, being a well-known and tried Weather Stone.
50,000 feet cube in stock.
PICTOR & SONS, BOX, WILTS.
[ADVT.

Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset.—Agent, Mr. E. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.

Doulting Free Stone
HAM HILL STONE,
BLUE LIAS LIME
(Ground or Lump),
For prices, &c., address S. & J. STAPLE, Quarry Owners, Stone and Lime Merchants, Stoke-under-Ham, Ilminster. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
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Self-Acting "FALL DOWN" GATE STOPS, and IMPROVED GATE FITTINGS of every Description.
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VIEILLE MONTAGNE BRAND.
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NO EXTERNAL FASTENINGS.
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